Data Center Product Introduction (Active part)

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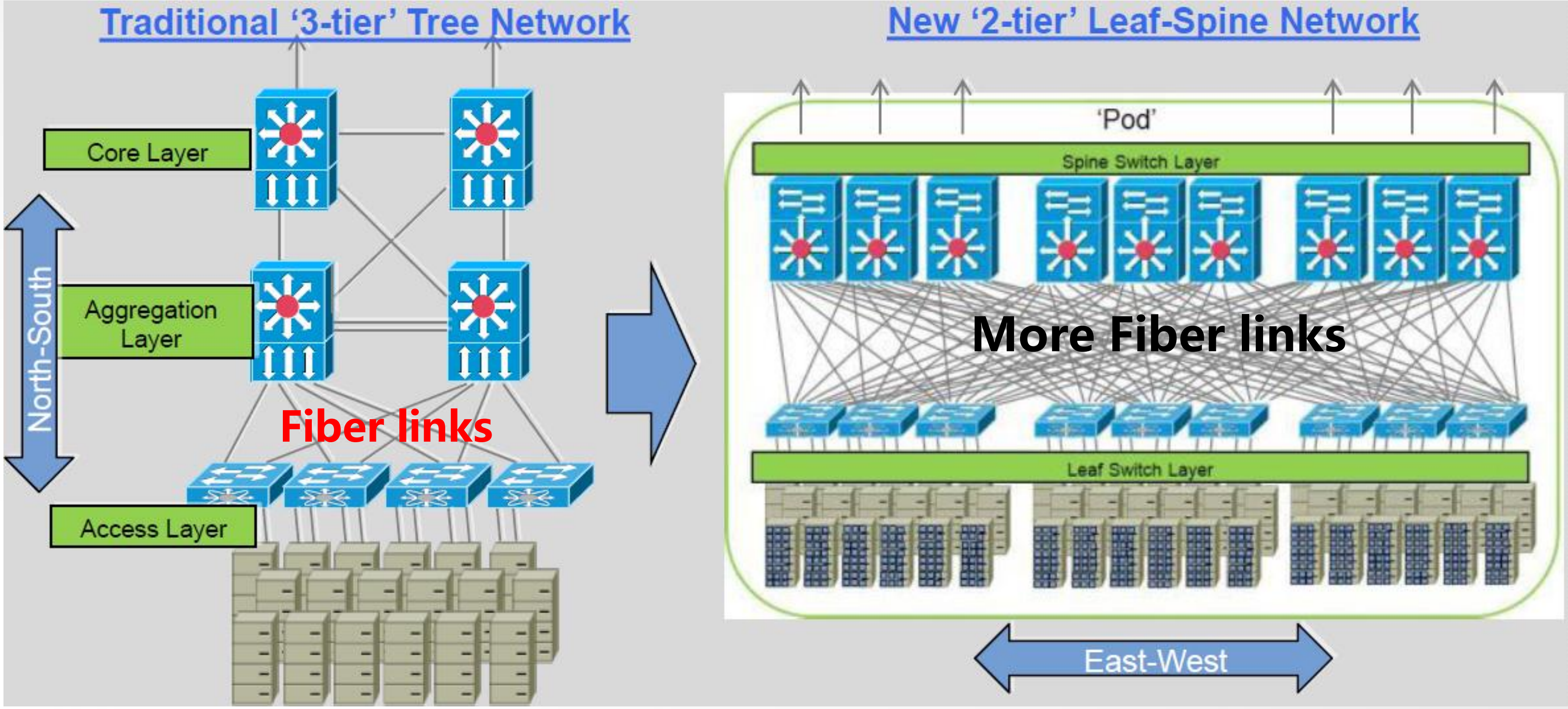
More Optics in the Data Center

DATA Center Network migrating from traditional 3-tier to flattened 2-tier topology

This means More connections, increasing use of optical links in datacenter

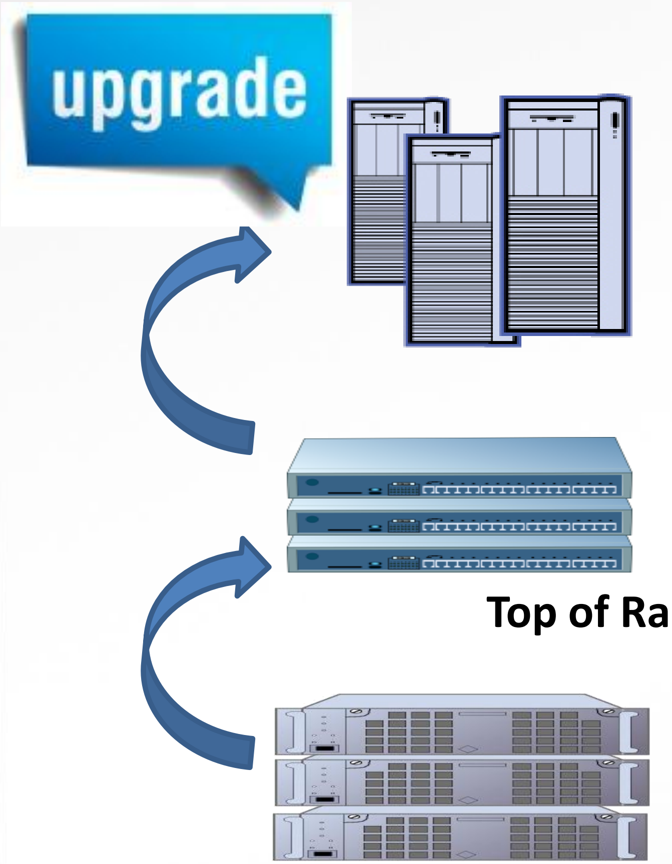


Yesterday

Today

*Source: Lightcounting

More Bandwidth in the Data Center



Core

Top of Rack Switch

Server

→ ***Time***

2012	2013	2014
N X 40Gb/s	100Gb/s	N X 100Gb/s
40Gb/s	N X 40Gb/s	100Gb/s
10Gb/s	N X 10Gb/s	40Gb/s

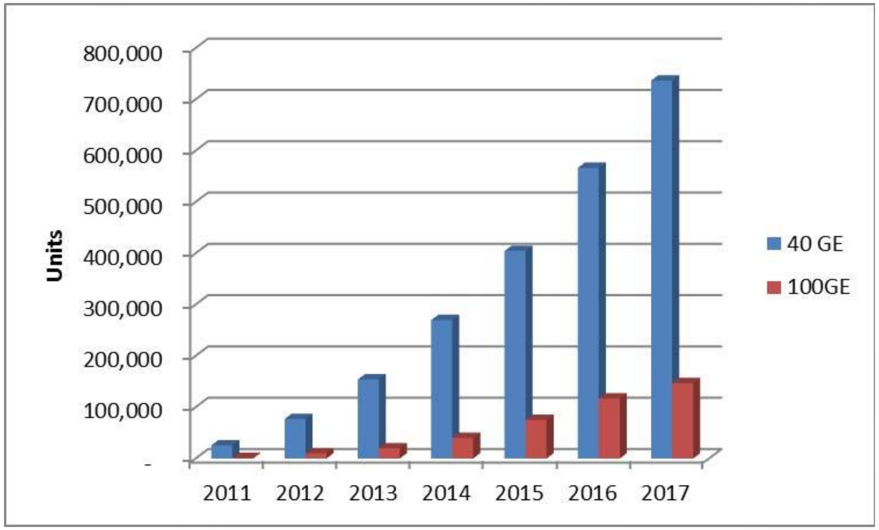
*Source: Lightcounting

40G vs. 100G in the Data Center

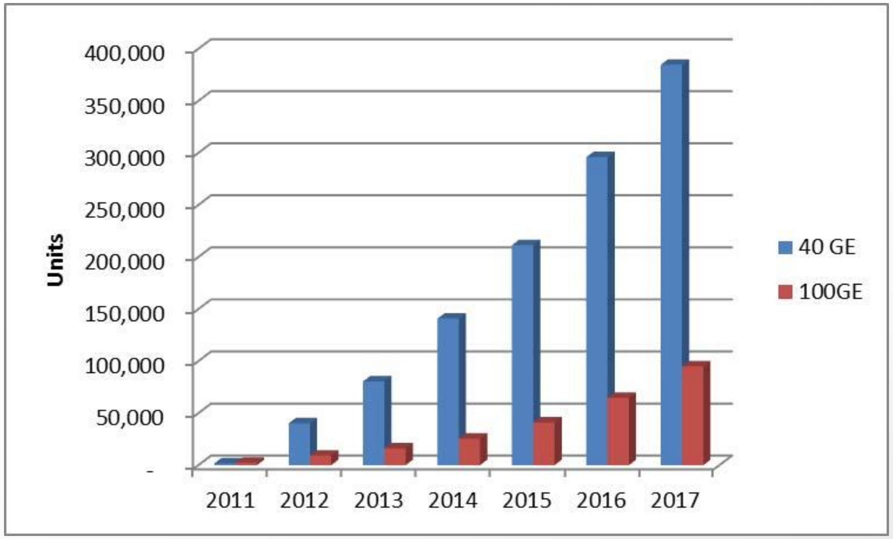
- ● 40G has
- ✓ Lowest cost per bit
- ✓ Multi mode fiber reaches up to 300m
- ✓ SMF and MMF in a common QSFP+ form factor

- ● 100G has
- ✓ Highest density
- ✓ Lowest power consumption per bit
- ✓ MMF reaches up to 300m

40G is here to stay



Multi Mode Fiber



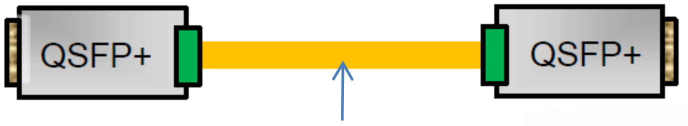
Single Mode Fiber

*Source: Lightcounting

40G QSFP+ and High-Density 10G QSFP+

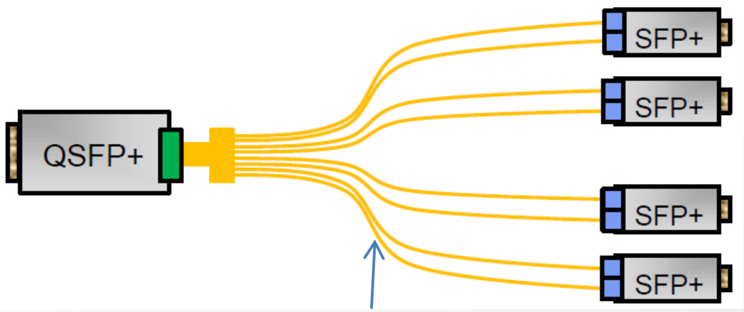
- QSFP+ = Quad SFP+
- 40G Ethernet can interoperate with 10G Ethernet

Point to Point 40G link



MMF or SMF

4x 10G Breakout



MMF or SMF

100G IEEE Standard

●IEEE 802.3ba

✓ 100GBASE-LR4 10km SMF Based on 4x25G LAN-WDM

✓ 100GBASE-ER4 40km SMF Based on 4x25G LAN-WDM

✓ **100GBASE-SR10** 100m OM3 MMF Based on 10x10G Parallel MMF

 CAUI 10x10G retimed electrical I/O(ex. 100G CFP SR10)

 CPPI 10x10G un-retimed electrical I/O(ex. 120G CXP)

Note that “10x10G SMF” (i.e., Neophotonics/Santur’s so-called “LR10”) is not a standardized IEEE interface!

● IEEE 802.3bm (in process)

 100GBASE-SR4 ~100m OM3 MMF Based on 4x25G Parallel MMF(100G QSFP28 SR4)

 CAUI-4 4x25G retimed electrical I/O

100G Ethernet optical interface overview

Optical

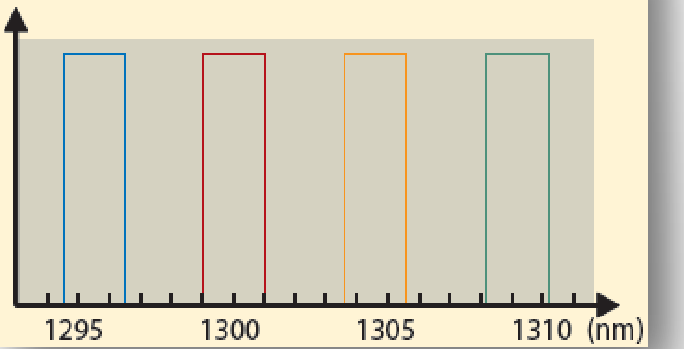
Average Optical Power

Parameter	100GBase-SR10	100GBase-LR4	100GBase-ER4
Max Launch Power/lane	2.4 dBm	4.5 dBm	2.9 dBm
Min Launch Power/lane	–8 dBm	–4.3 dBm	–2.9 dBm
Max Avg Rx Power/lane	2.4 dBm	4.5 dBm	4.5 dBm
Min Avg Rx Power/lane	–9.9 dBm	–10.6 dBm	–20.9 dBm

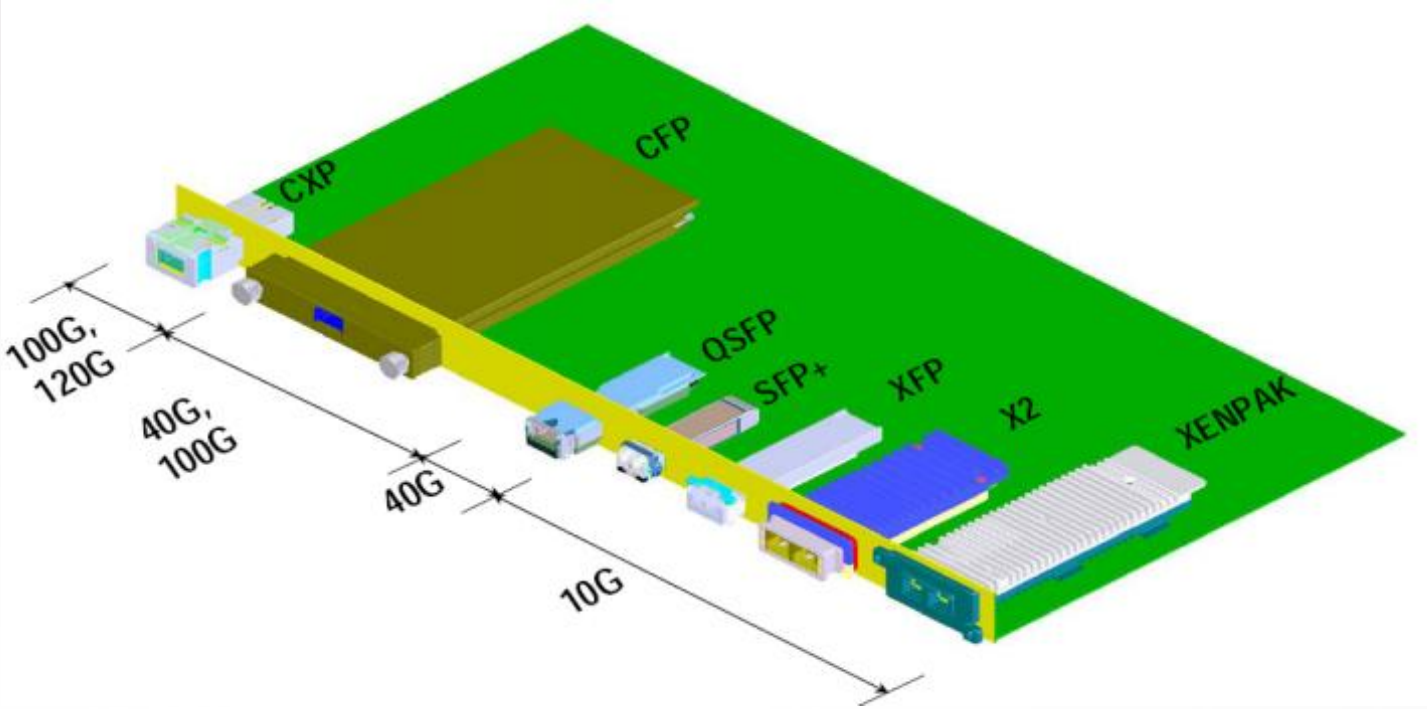
100GBase-LR4 and ER4 LWDM Lane Assignments

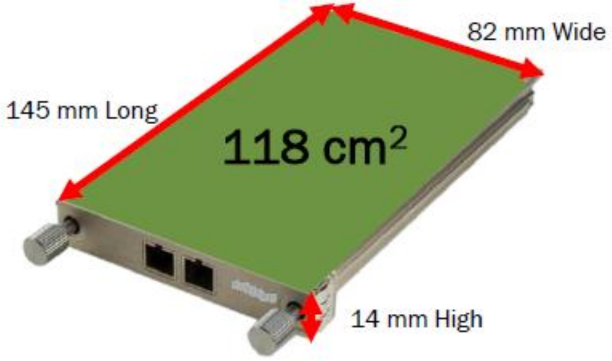
Lane	Center λ	λ Range
L_0	1295.56 nm	1294.53 to 1296.59 nm
L_1	1300.05 nm	1299.02 to 1301.09 nm
L_2	1304.58 nm	1303.54 to 1305.63 nm
L_3	1309.14 nm	1308.09 to 1310.19 nm

LWDM Wavelength Range



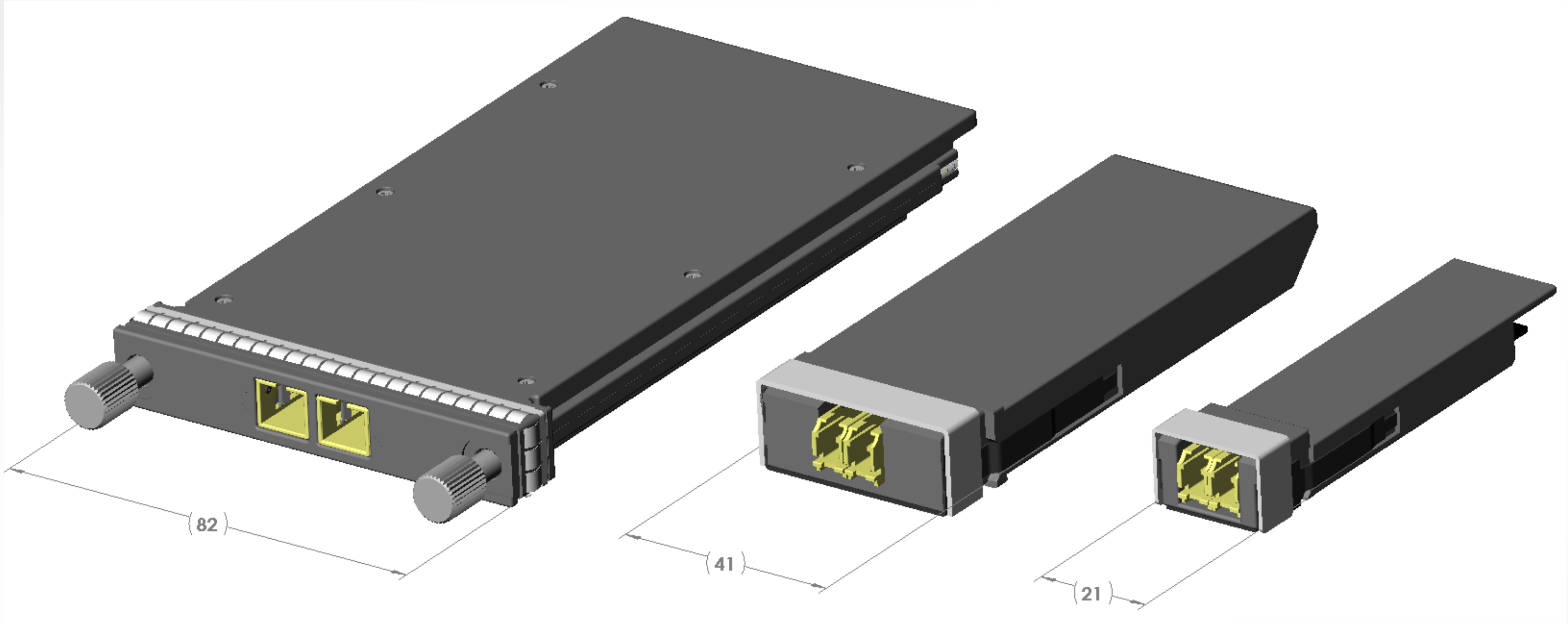
Graphical View of Module Form Factors



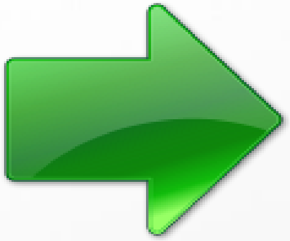


CFP Form factor is larger than an iPhone 4

100GE CFP Module Form-Factor Evolution



CFP CFP2 CFP4



Time

40GbE Optics Overview

Choosing the right 40G Module

CFP

QSFP

QSFP AOC

Form Factor	Retimed (CDR)	Connector	Fiber Type	Max Reach	Electrical Signaling (Gbps)	Optical Signaling (Gbps)	Protocols and Power
40G QSFP+ SR4	NO	MPO 12Fiber	MMF(OM3)	300m	4 X 10	4 X 10	40G Ethernet, <1.5W
56G QSFP+ SR4	NO	MPO 12Fiber	MMF(OM3)	100m	4 X 14	4 X 14	40G Ethernet, FDR, <1.5W
40G QSFP+ LR4	NO	Duplex LC	SMF	10km	4 X 10	4 X 10	40G Ethernet, <3.5W
40G QSFP+ AOC*	NO	N/A	MMF	300m	4 X 10	4 X 10	40G Ethernet, InfiniBand, FC, <1.5W
56G QSFP+ AOC*	NO	N/A	MMF(OM3)	100m	4 X 14	4 X 14	40G Ethernet, FDR, FC, <1.5W

100GbE Optics Overview

Choosing the right 100G Module

QSFP28

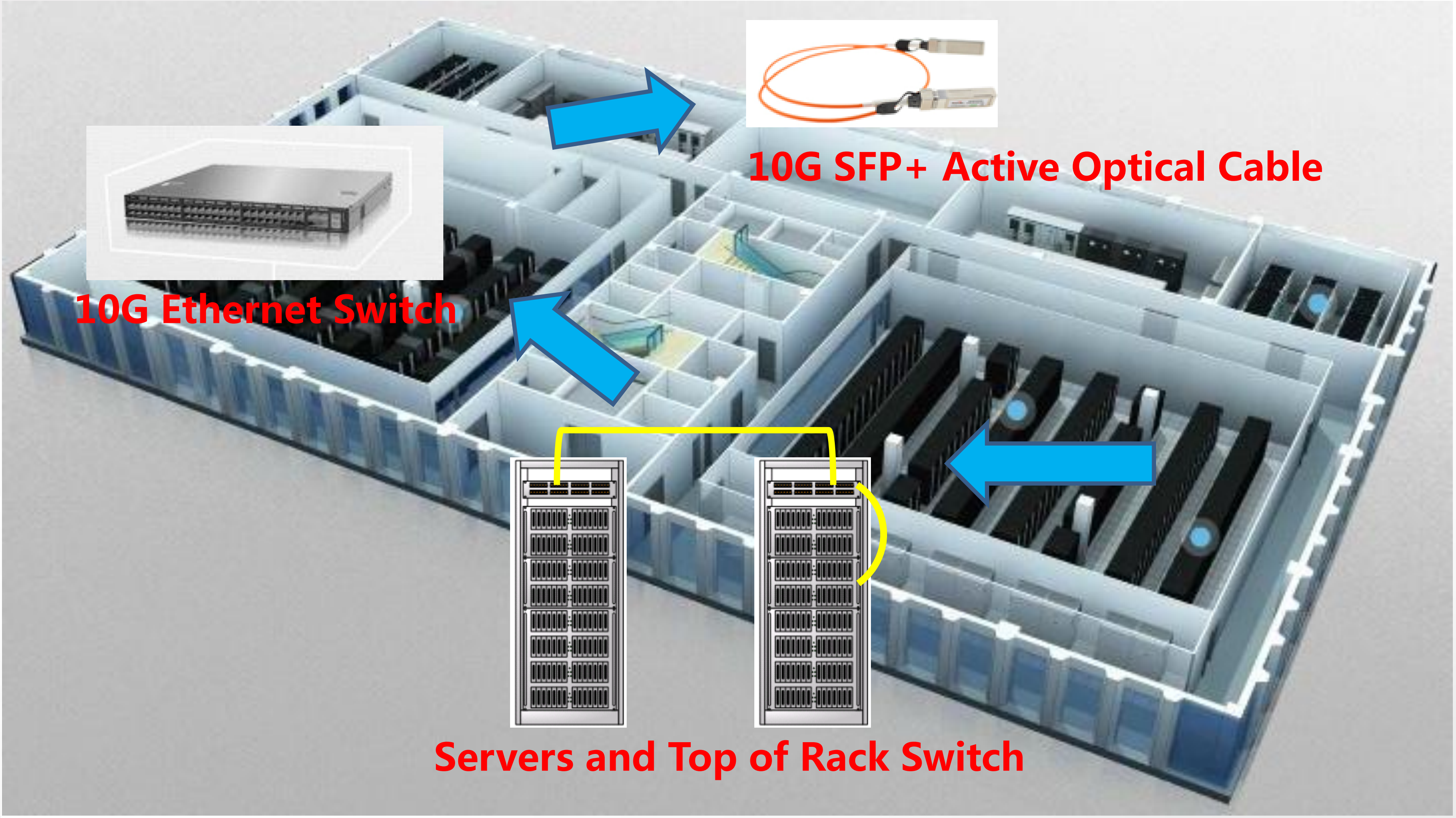
CFP

CXP

CXP AOC

Form Factor	Retimed (CDR)	Connector	Fiber Type	Max Reach	Electrical Signaling (Gbps)	Optical Signaling (Gbps)	Protocols and Power
***100G QSFP28 SR4**	Optional	**MPO 8 Fiber**	MMF(OM3)	100m	**4 X 25**	4 X 25	Ethernet, <2W(without CDR)
100G CFP SR10	Yes	MPO 24Fiber	MMF(OM3)	300m	10 X 10	10 X 10	Ethernet, <8W
100G CFP2 SR10	Yes	MPO 24Fiber	MMF(OM3)	300m	10 X 10	10 X 10	Ethernet, <6W
120G CXP MMF	NO	MPO 24Fiber	MMF(OM3)	300m	12X 10	12 X 10	Ethernet, InfiniBand, <4.5W
120G CXP AOC	NO	N/A	MMF(OM3)	300m	12X 10	12 X 10	Ethernet, InfiniBand,<3.5W

Active Optical Cables Primer

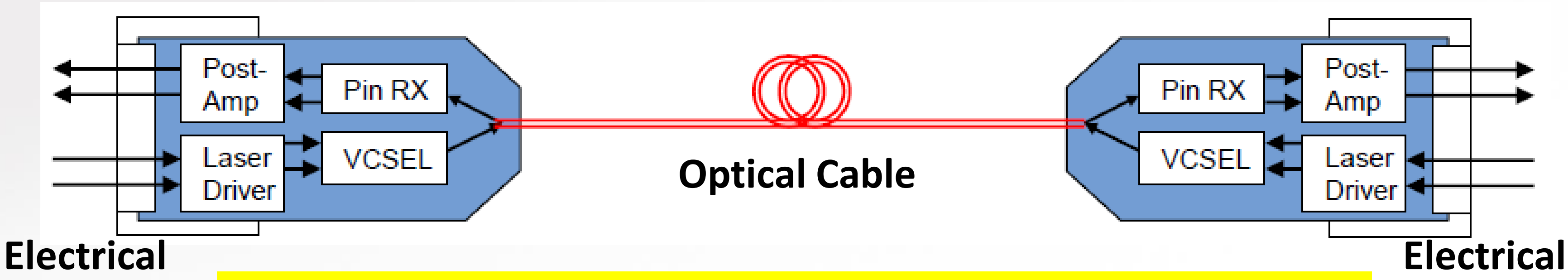


10G SFP+ Active Optical Cable

10G Ethernet Switch

Servers and Top of Rack Switch

Active Optical Cables Primer

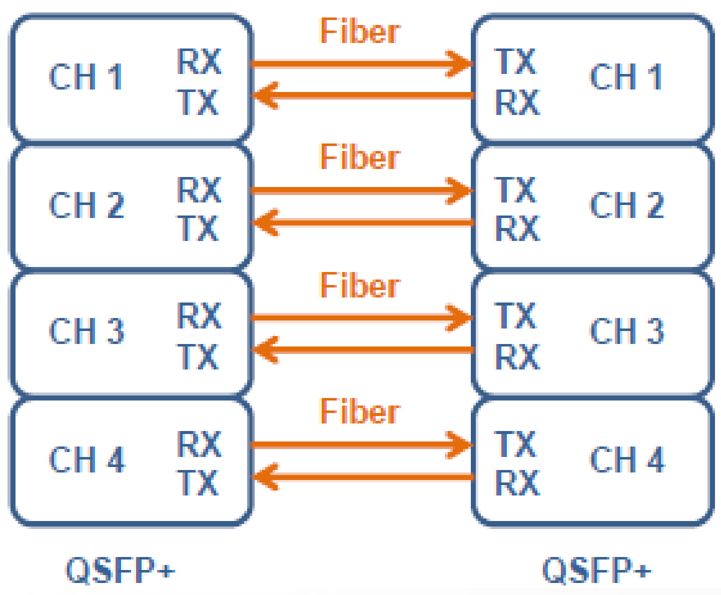


Optical-to-Electrical conversion is inside the cable end-plugs

Compare to Copper Cables	Compare to Optical Transceivers
Longer range（300 meter on OM3 MMF）	Cost-optimized: Not constrained by optical interface specifications driven by longer-reach applications, without DDM function.
Lower weight and high bending performance, means easier cable management	Datacenter/Consumer friendly: No cleanliness issues in optical connector
Thinner cables allow better airflow for cooling in Data Center	Disadvantage: Cannot be routed through optical patch panels
Lower power consumption, with no power-hungry conditioning ICs required on the host board	

56G QSFP+ Active Optical Cable

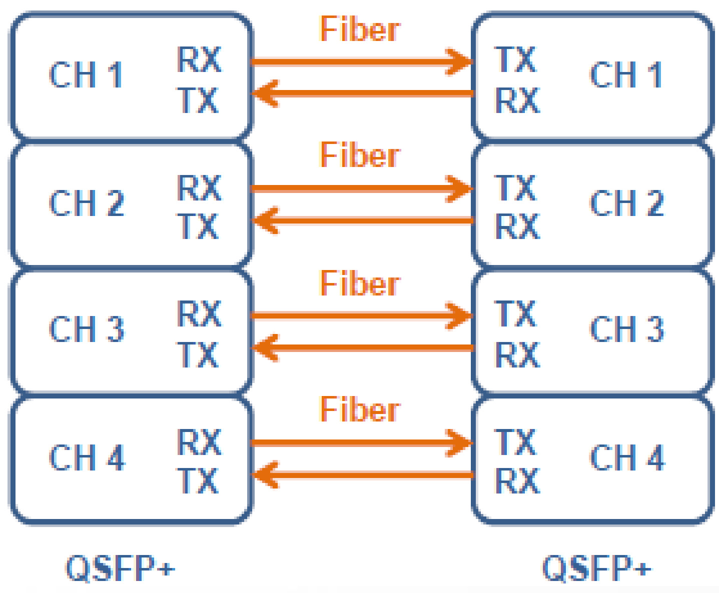
- Compliant to SFF-8436 etc.
- Aggregate Data rate Supports 56Gbps
- FDR InfiniBand and 40G Ethernet
- Maximum link length of up to 150m*
  （OM3 MMF）
- 4Ch VCSEL array and 4Ch PIN array
- Low power consumption <1.5W*



Type	Tx Power（dBm）		Rx Power（dBm）	
	Min	Max	Min	Max
40Gbase-SR4	-7.5	2.5	-9.5	2.4
Center wavelength (nm)	Operating temperature（C°）	Rate per Channel（Typical）	Extinction ratio	
			Min	Max
850	0 to 70	14.025	3	-

40G QSFP+ Active Optical Cable

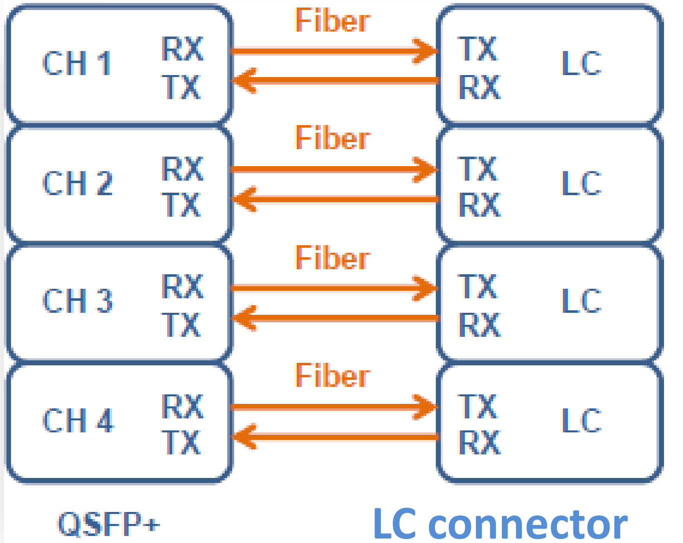
- Compliant to SFF-8436 etc.
- Aggregate Data rate Supports 40Gbps
- QDR InfiniBand and 40G Ethernet
- Maximum link length of up to 300m （OM3 MMF）
- 4Ch VCSEL array and 4Ch PIN array
- Low power consumption <1.5W

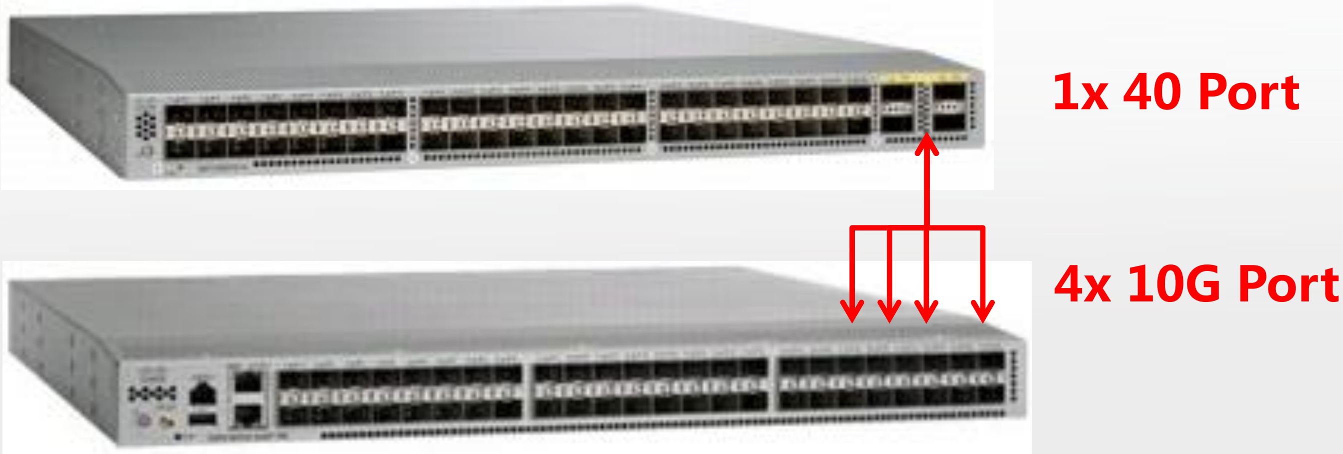


Type	Tx Power（dBm）		Rx Power（dBm）	
	Min	Max	Min	Max
40Gbase-SR4	-7.5	2.5	-9.5	2.4
Center wavelength (nm)	Operating temperature（C°　）	Rate per Channel（Typical）	Extinction ratio	
			Min	Max
850	0 to 70	10.3125	3	-

40G QSFP+ to 8x LC Breakout AOC

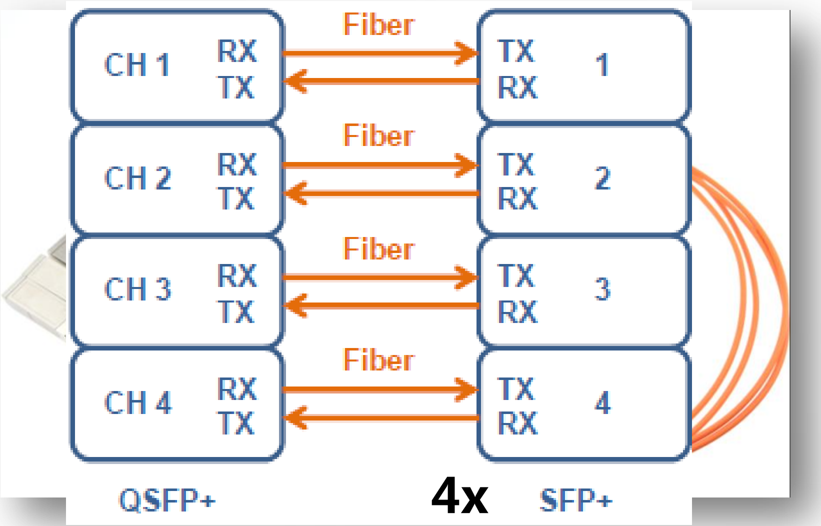
- Compliant to SFF-8436 etc.
- Aggregate Data rate Supports 40Gbps rate
- 8 LC connecter breakout
- Maximum link length of up to 300m （OM3 MMF）
- 4CH VCSEL array and PIN array
- Low power consumption <1.5W @40 QSFP+ port





40G QSFP+ to 4x 10G SFP+ Breakout AOC

- Compliant to SFF-8436 and SFF-8431
- Aggregate Data rate Supports 40Gbps
- 8 LC connecter breakout
- Maximum link length of up to 300m （OM3 MMF）
- SFP+ power dissipation <0.9W
- QSFP+ power dissipation <1.5W



1x 40 Port

4x 10G Port

120G CXP Active Optical Cable

- 300 m reach on Parallel multi-mode fiber(OM4)
- CXP MSA module form factor
- IEEE 802.3ba 100Gbase-SR10 and InfiniBand 12xQDR
  - ✓ 12x10G Optical
  - ✓ 12x10G Electrical I/O (CAUI)
- Operating case temperature range of 0° C to +70° C
- Power consumption < 3.5W per End
- Digital Diagnostic function

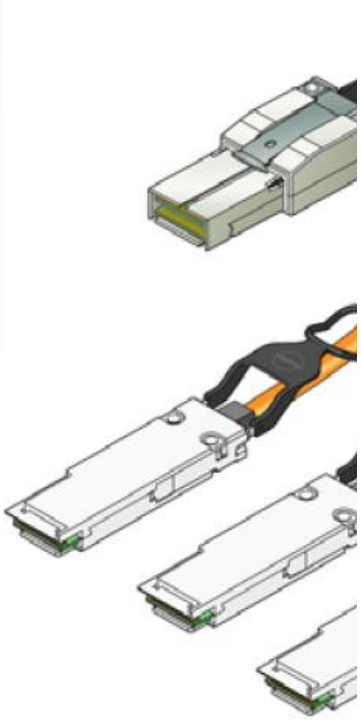
Type	TX power（dBm）		RX power（dBm）	
	Min	Max	Min	Max
100Gbase-SR10	-7.6	2.4	-9.5	2.4

Center wavelength (nm)	Operating temperature（C° ）	Rate per Channel（Typical）	Extinction ratio	
			Min	Max
850	0 to 70	10.3125	3.0	-

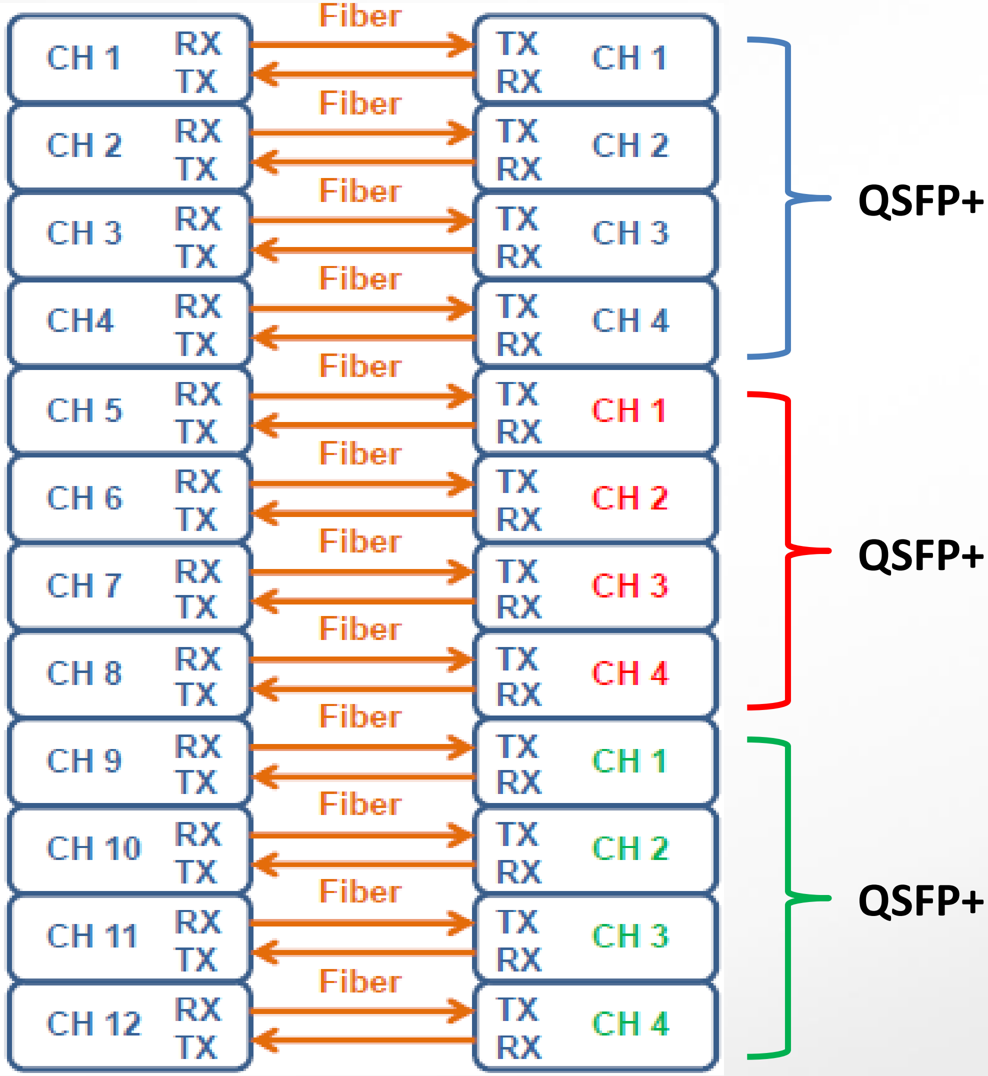
120G CXP to 3x 40G QFP+ Breakout AOC

120G CXP

40GQ SFP+



c. CXP to
QSFP active c



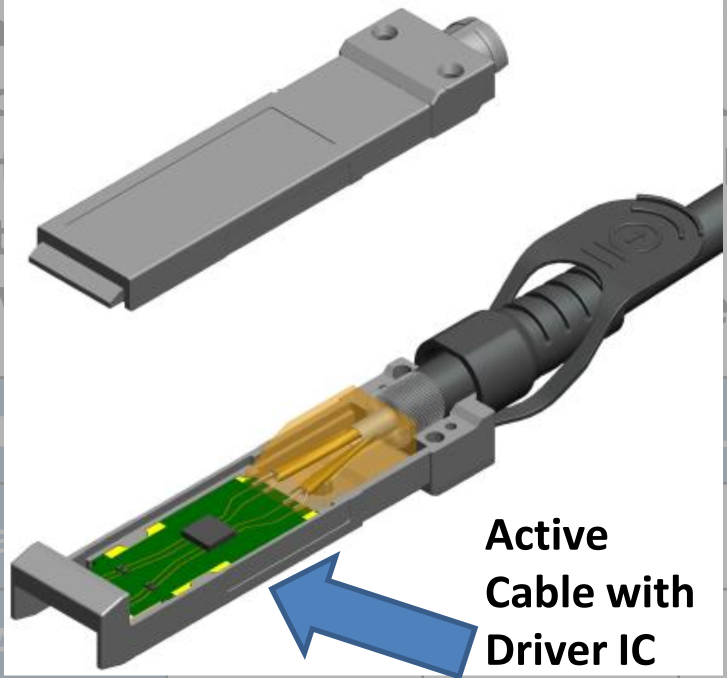
CH 1	RX TX	Fiber	TX RX	CH 1	QSFP+
CH 2	RX TX	Fiber	TX RX	CH 2	
CH 3	RX TX	Fiber	TX RX	CH 3	
CH4	RX TX	Fiber	TX RX	CH 4	
CH 5	RX TX	Fiber	TX RX	CH 1	QSFP+
CH 6	RX TX	Fiber	TX RX	CH 2	
CH 7	RX TX	Fiber	TX RX	CH 3	
CH 8	RX TX	Fiber	TX RX	CH 4	
CH 9	RX TX	Fiber	TX RX	CH 1	QSFP+
CH 10	RX TX	Fiber	TX RX	CH 2	
CH 11	RX TX	Fiber	TX RX	CH 3	
CH 12	RX TX	Fiber	TX RX	CH 4	

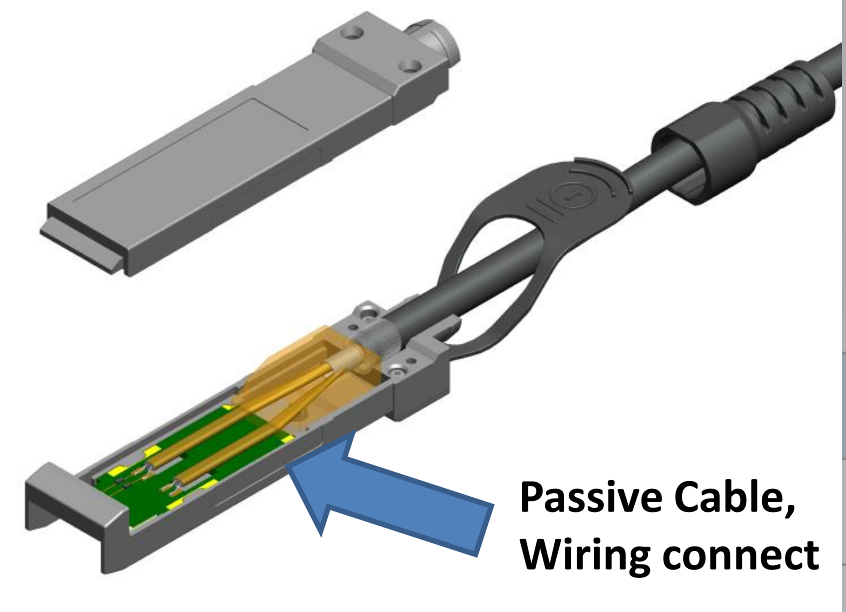
120G CXP **3 X 40G QSFP+**

10G SFP+ Active/Passive Copper Cable

- Compliant to SFF-8431 and 8461
- Supports 11.3Gbps rate
- Pa up to 5m
- Ac up to
- Bi BER1
- Ut

*AW gau


Active Cable with Driver IC


Passive Cable, Wiring connect

T			Link l			
Pa			3m			
A			30	24	24	
Active	5m	6m	7m	8~10m	11m	12m
AWG	30	30	30	28	24	24

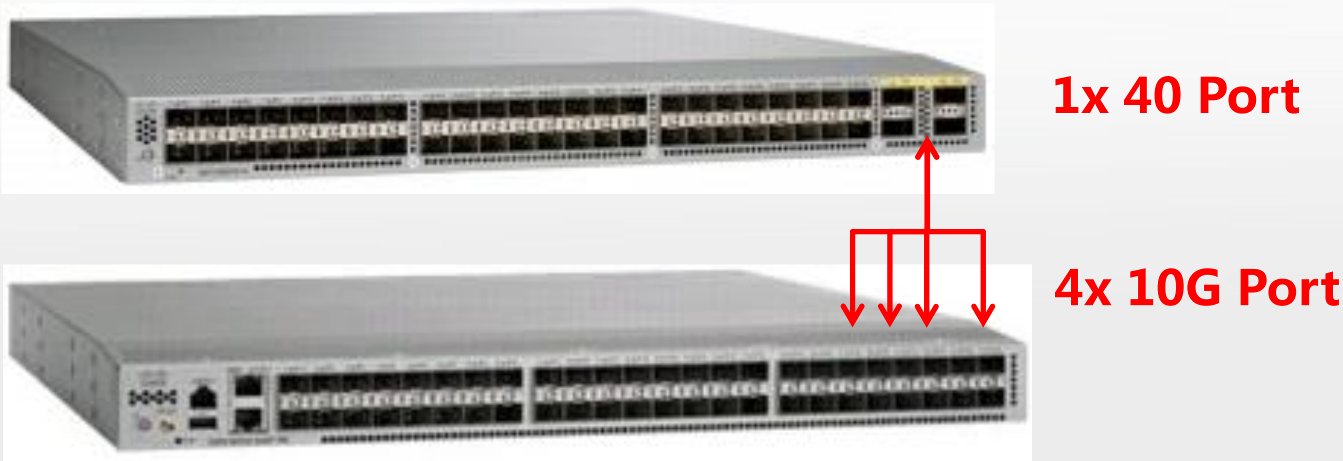
40G QSFP+ Active/Passive Copper Cable

- **Compliant to SFF-8436**
- **Aggregate Data rate supports 40Gbps**
- **Passive Maximum link length of up to 5m**
- **Active Maximum link length of up to 10m**
- **Bit Error Rate (BER) better than BER10^{-15}**
- **Utilizes LEONI Copper Cable**

Type	Link length				
Passive	1m	3m	5m		
Active			5m	7m	10m
AWG	30	30	28	26	26

40G QSFP+ to 4x 10G SFP+ Breakout Copper Cable

- Compliant to SFF-8436 and SFF-8431
- Aggregate Data rate supports 40Gbps
- Passive Maximum link length of up to 5m
- Active Maximum link length of up to 10m
- Bit Error Rate (BER) better than BER10^{-15}
- Utilizes LEONI Copper Cable

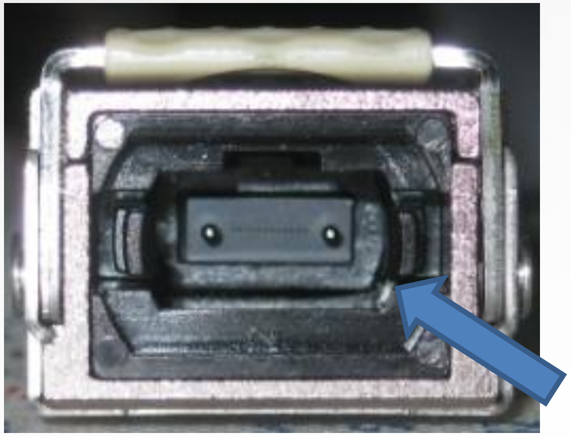


40G QSFP+ SR4

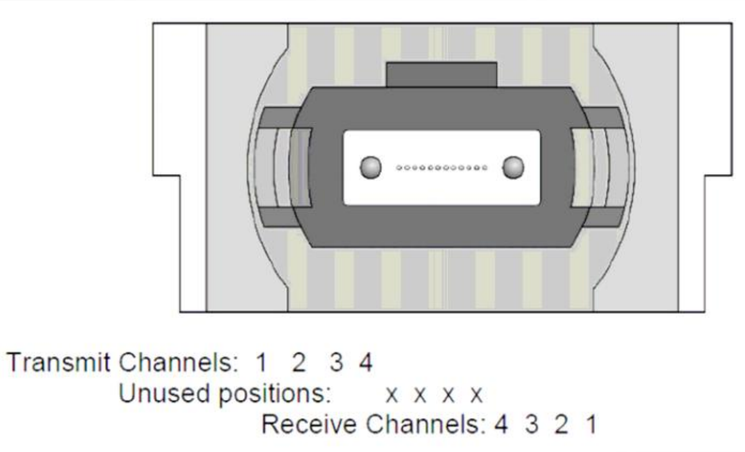
- 300m reach on Parallel multi-mode fiber(OM3)
- QSFP+ MSA module form factor
- Complaint with IEEE 802.3ba 40Gbase-SR4
  - ✓ 4x10G Optical
  - ✓ 4x10G Electrical I/O (XLPPI)
- Operating case temperature range of 0° C to +70° C
- Power consumption <1.5W
- Male MPO receptacle(12 Fiber)
- Digital Diagnostic function

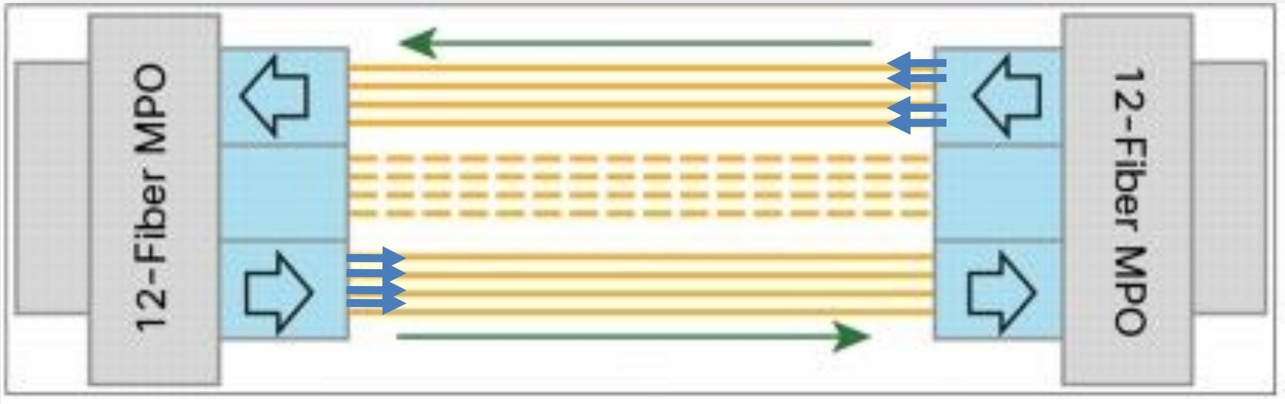
Type	TX power（dBm）		RX power（dBm）	
	Min	Max	Min	Max
40Gbase-SR4	-7.5	+2.5	-12.0	+1.0
Center wavelength (nm)	Operating temperature（C°）	Rate per Channel（Typical）	Extinction ratio	
			Min	Max
850	0 to 70	10.3125	3.0	-

40G QSFP SR4 Optical Interface



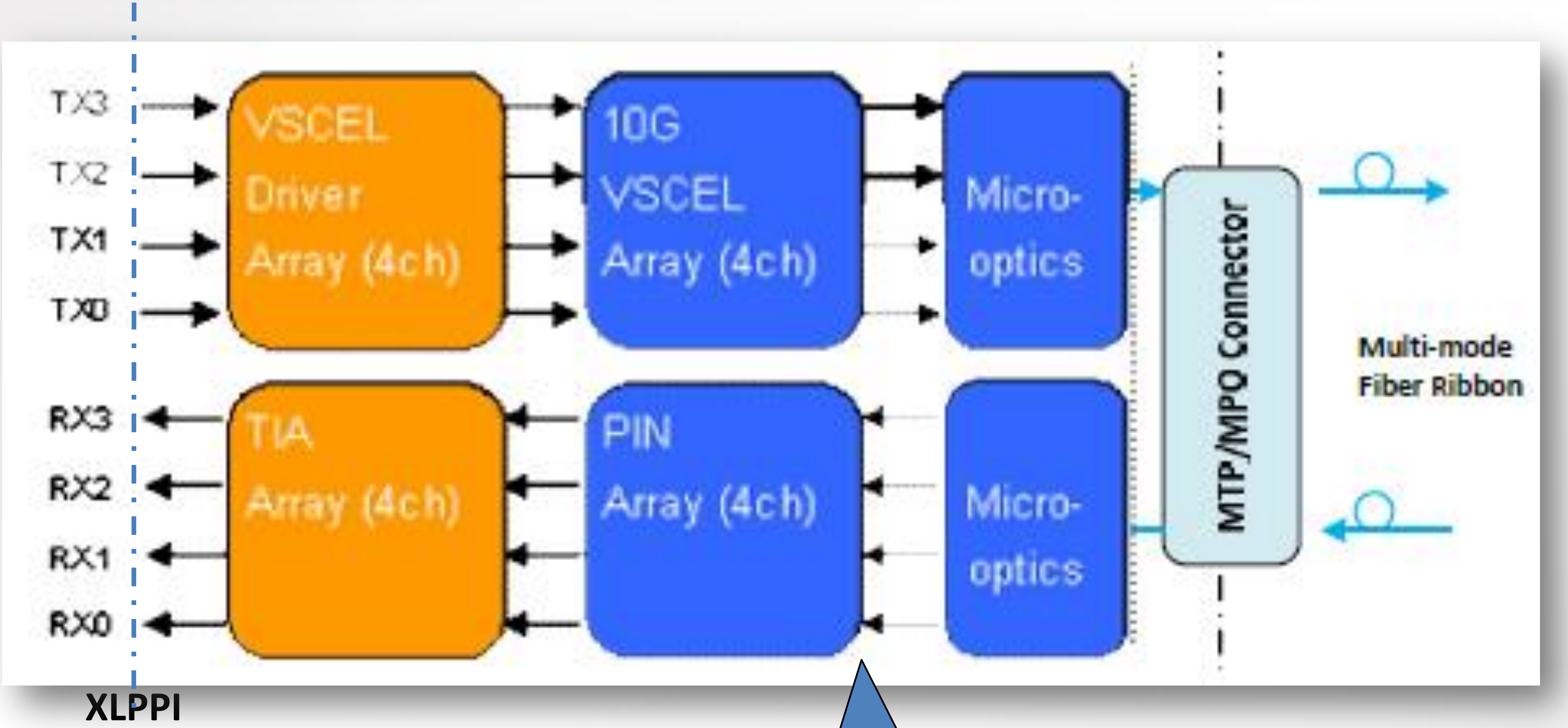
MPO 12-fiber male receptacle


Transmit Channels: 1 2 3 4
Unused positions: x x x x
Receive Channels: 4 3 2 1



MPO 12-fiber Female connecter

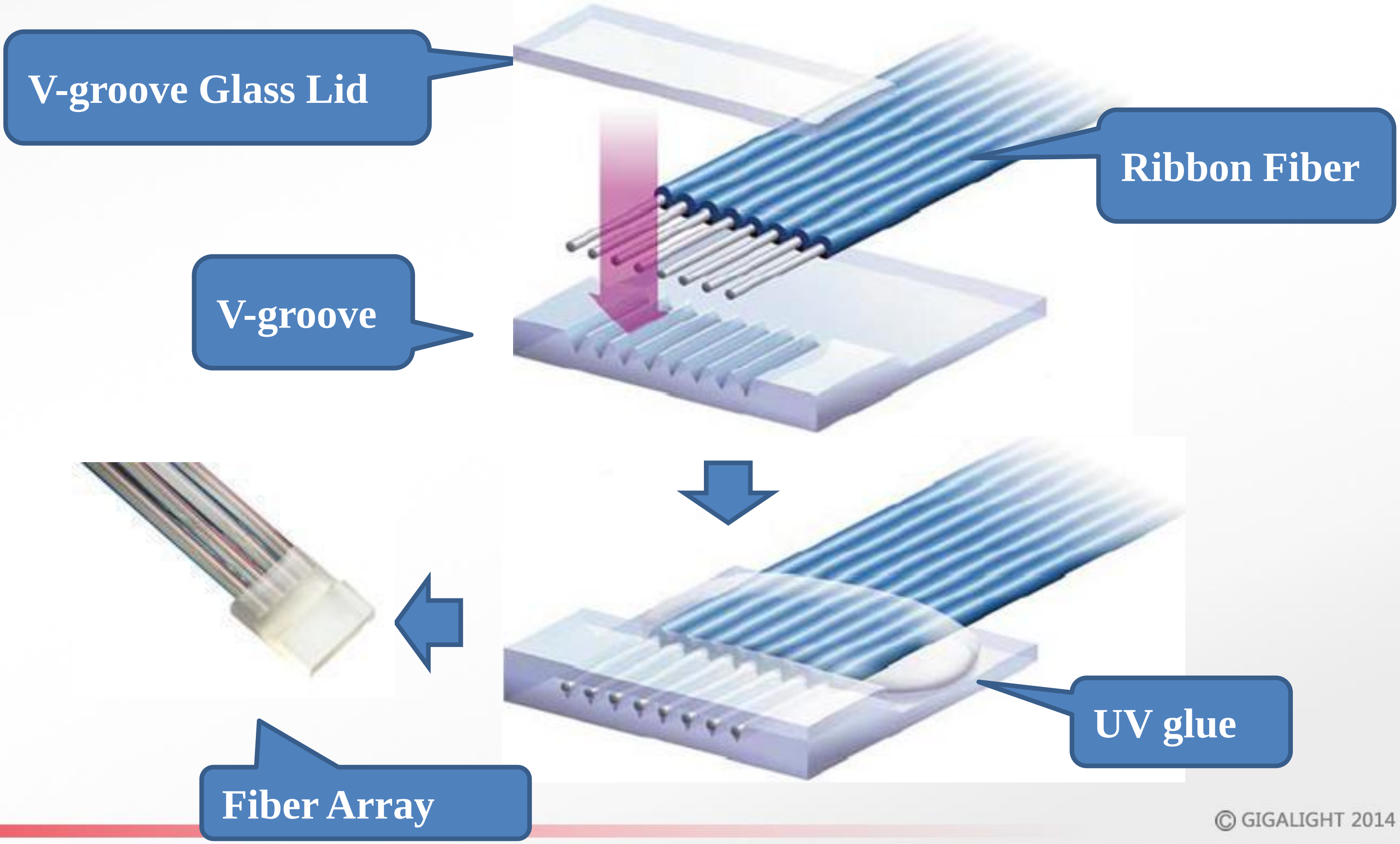
40G QSFP+ SR4 Block Diagram



40G QSFP SR4

Fiber Array Coupling Technology(1)

- Gigalight developed parallel optical coupling precisely devices package platform (Patent number: CN 102496614 A), it achieves a highly efficient Multimode or Single mode parallel optical coupling technology for VCSEL array and PD array.



V-groove Glass Lid

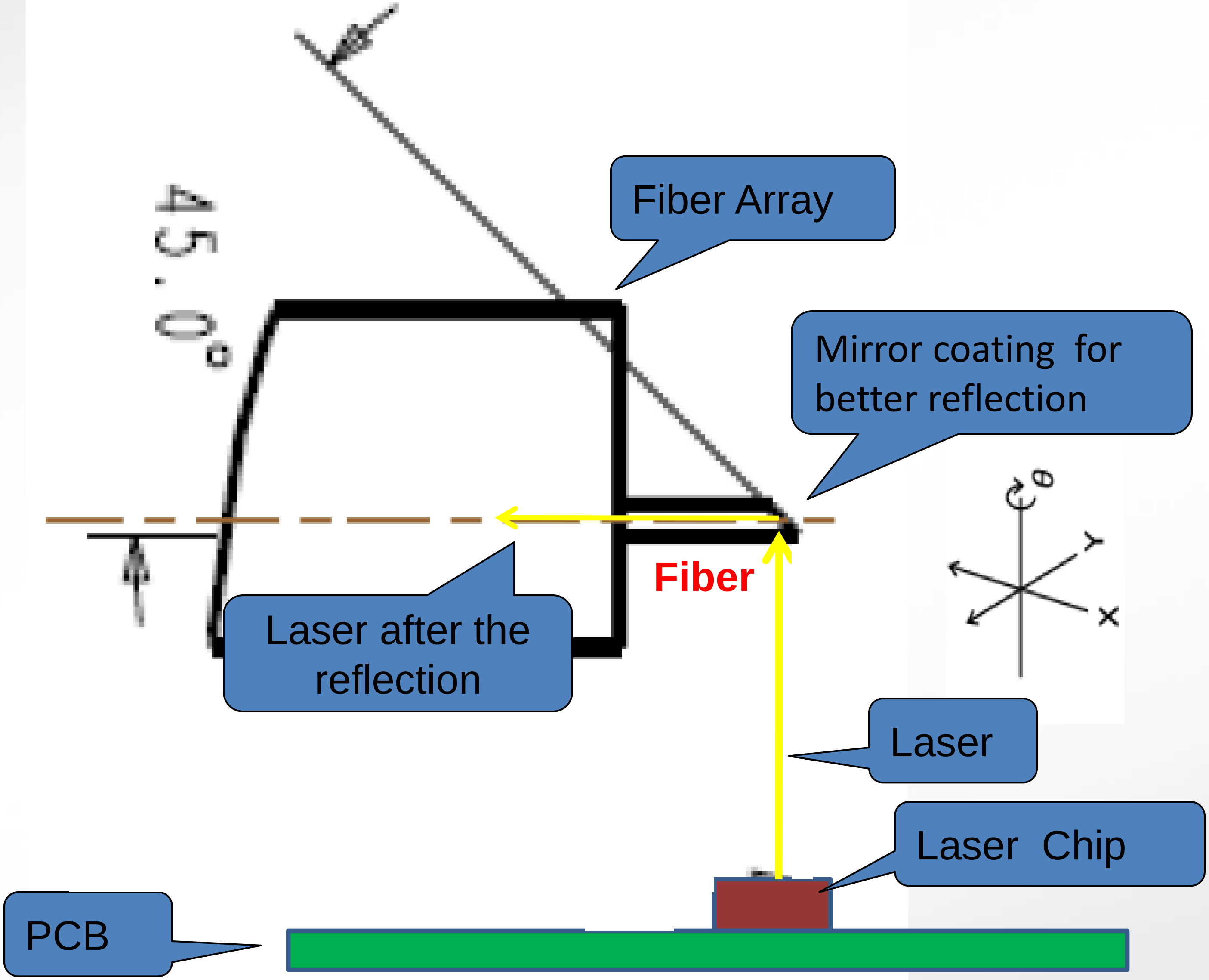
Ribbon Fiber

V-groove

UV glue

Fiber Array

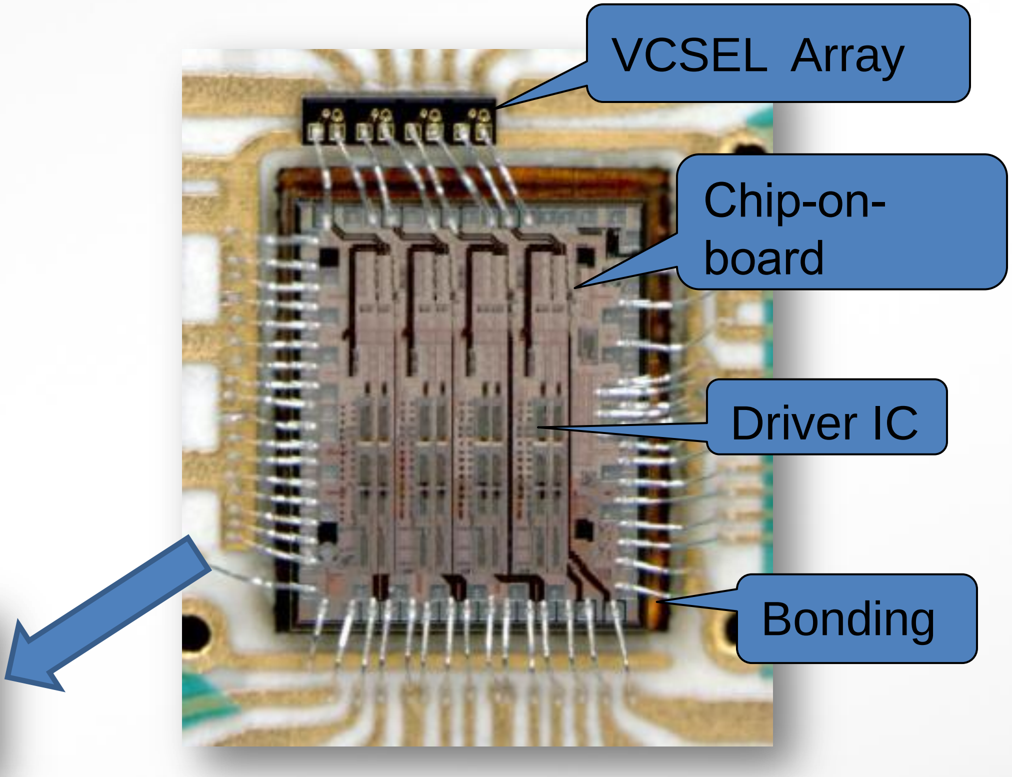
Fiber Array Coupling Technology(2)


45.0°
Fiber Array
Mirror coating for better reflection
θ
Y
X
Fiber
Laser after the reflection
Laser
Laser Chip
PCB

MMF Parallel Optical Engine

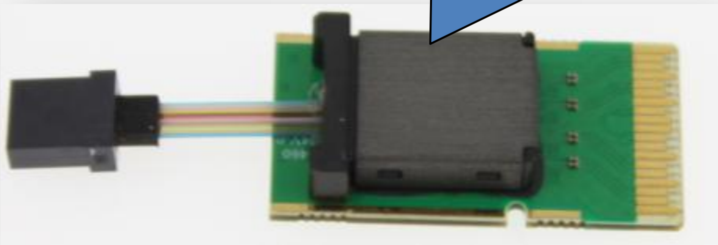
- **Chip on Board (CoB) optoelectronic device design and packaging technology.**

✓ **Small size**
✓ **Low power consumption**
✓ **Highly integration**

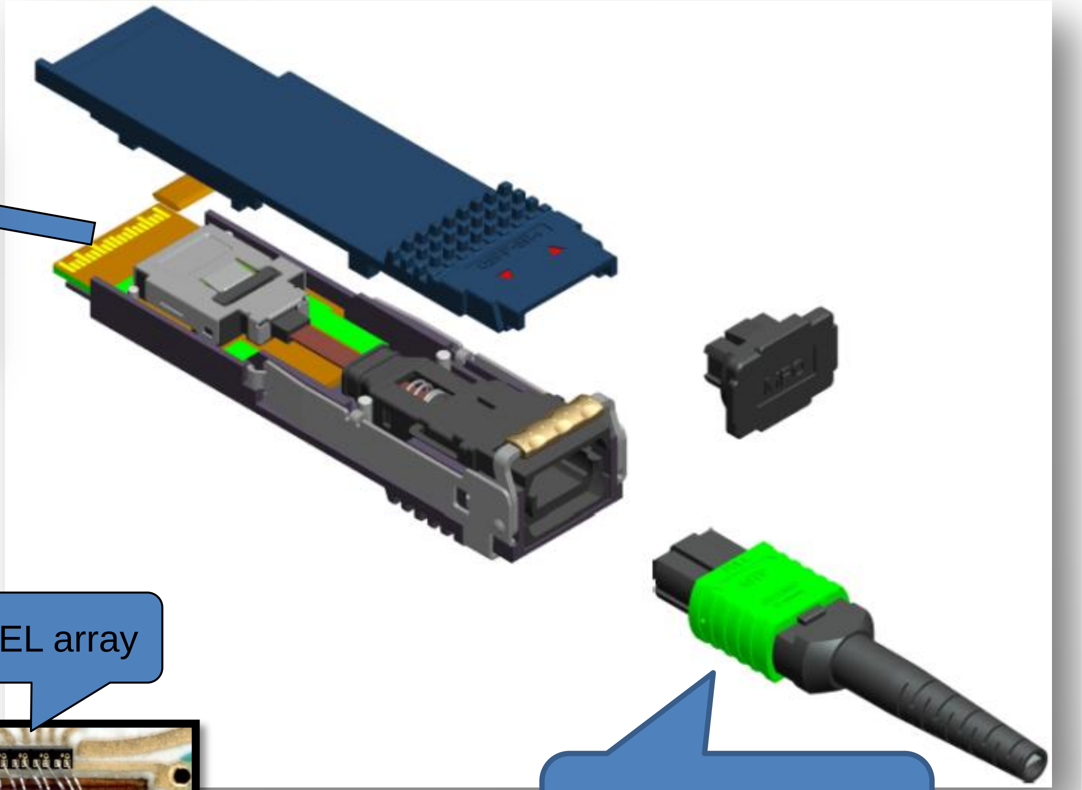


MMF Parallel Optical Engine for 40G QSFP+ SR4

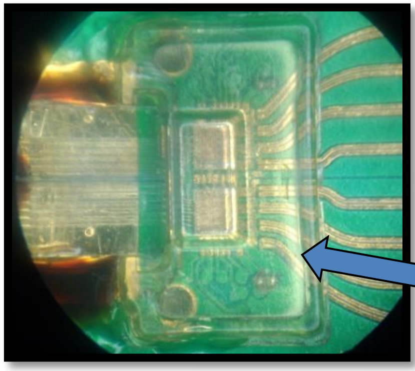
40G QSFP+ SR4 Module Internal

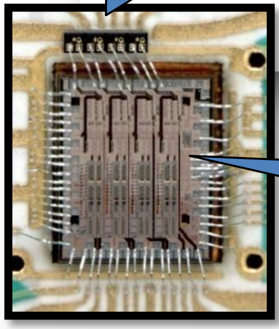


40G Optical Engine for 40G BASE-SR4



12 Fiber Female MPO Connector





4x VCSEL array

4x LD Driver Array

40G QSFP+ LR4

- 10km reach on Single mode 2 fiber
- QSFP+ MSA module form factor
- Complaint with IEEE 802.3ba 40Gbase-LR4

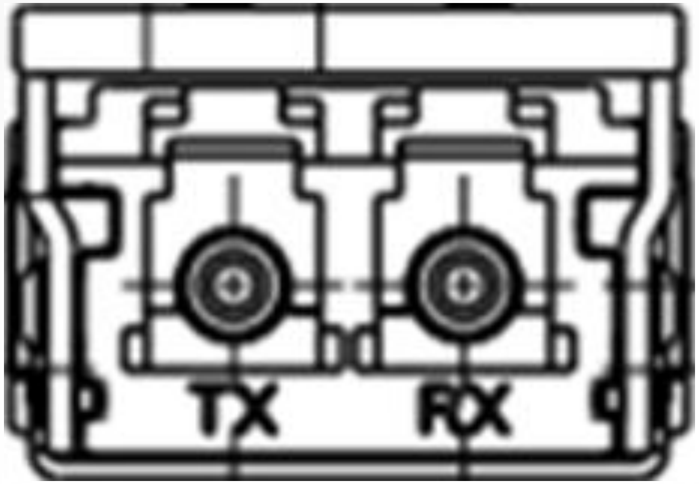
✓ 4x10G Optical (1271, 1291, 1311, 1331nm CWDM)

✓ 4x10G Electrical I/O (XLPPI)

- Operating case temperature range of 0° C to +70° C
- Power consumption <3.5 W
- Duplex LC receptacle optical interface(2 Fiber)
- Digital Diagnostic function

Type	TX power（dBm）		RX power（dBm）	
	Min	Max	Min	Max
40Gbase-LR4	-7.5	+2.3	-13.7	+2.3
Center wavelength (nm)	Operating temperature（C° ）	Rate per Channel（Typical）	Extinction ratio	
			Min	Max
1270, 1290, 1310, 1330	0 to 70	10.3125	3.5	-

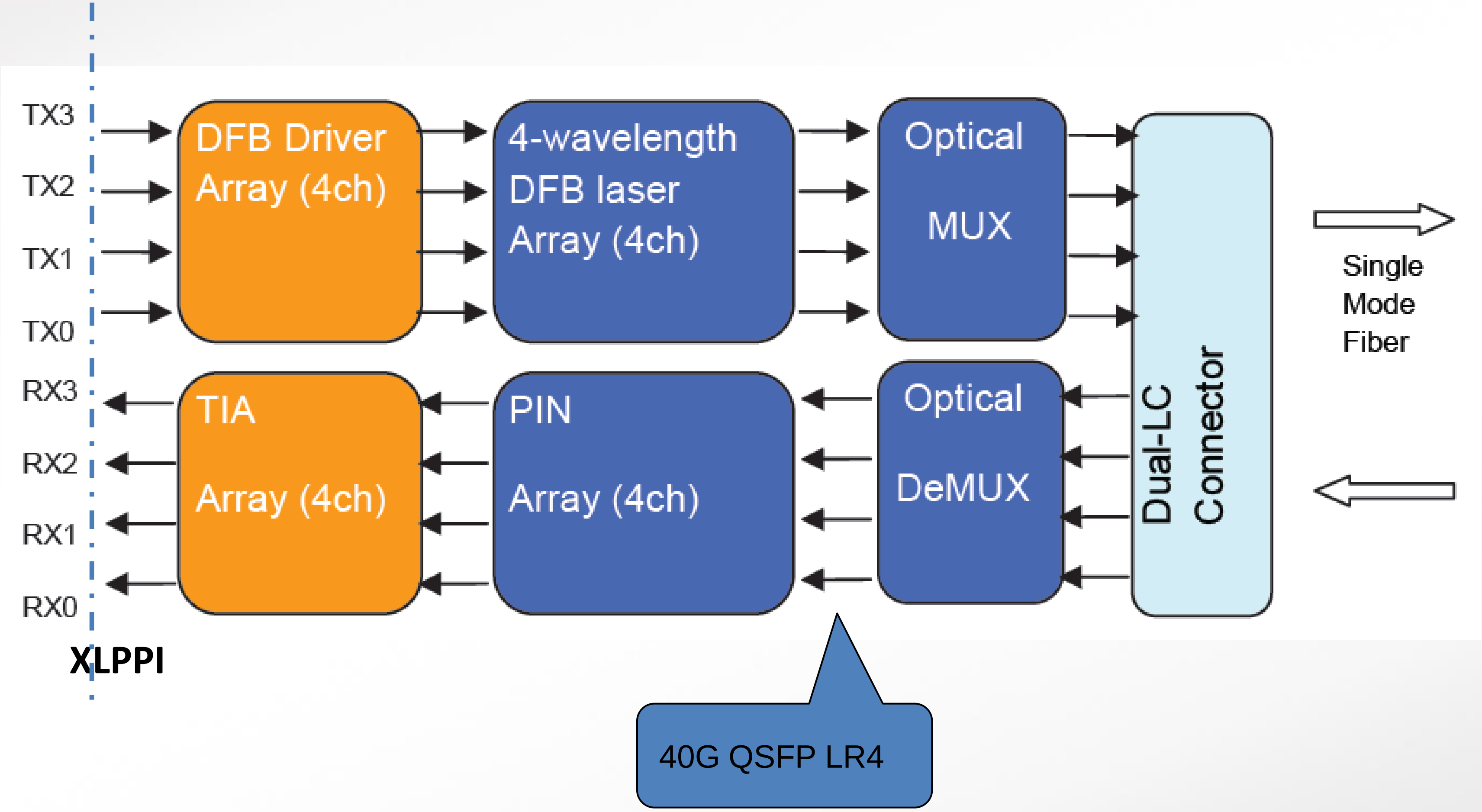
40G QSFP LR4 Optical Interface



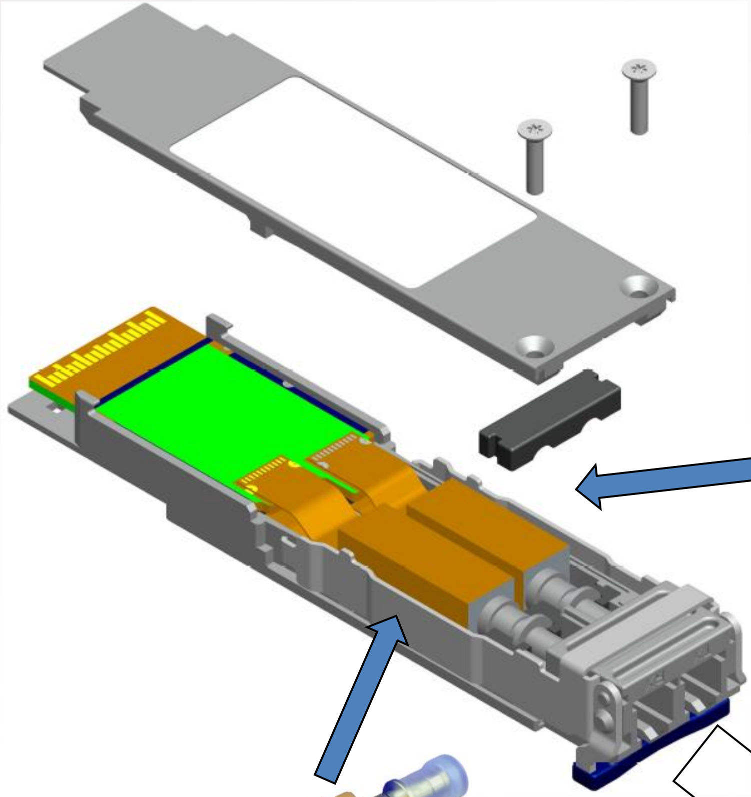
Duplex LC Optical receptacle(2 fiber)

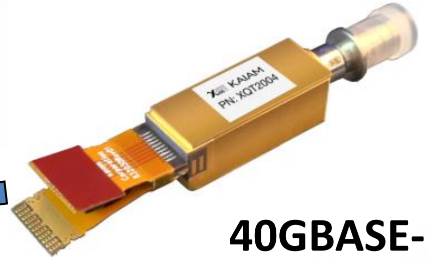
Duplex LC Optical Connector

40G QSFP+ LR4 Block Diagram

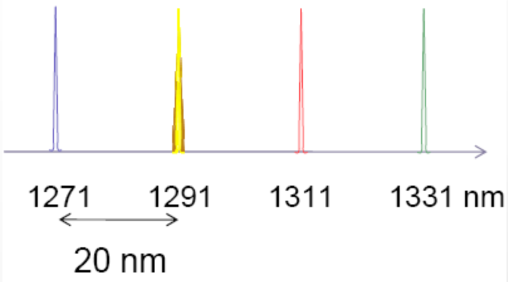


40G QSFP+ LR4 Module Internal





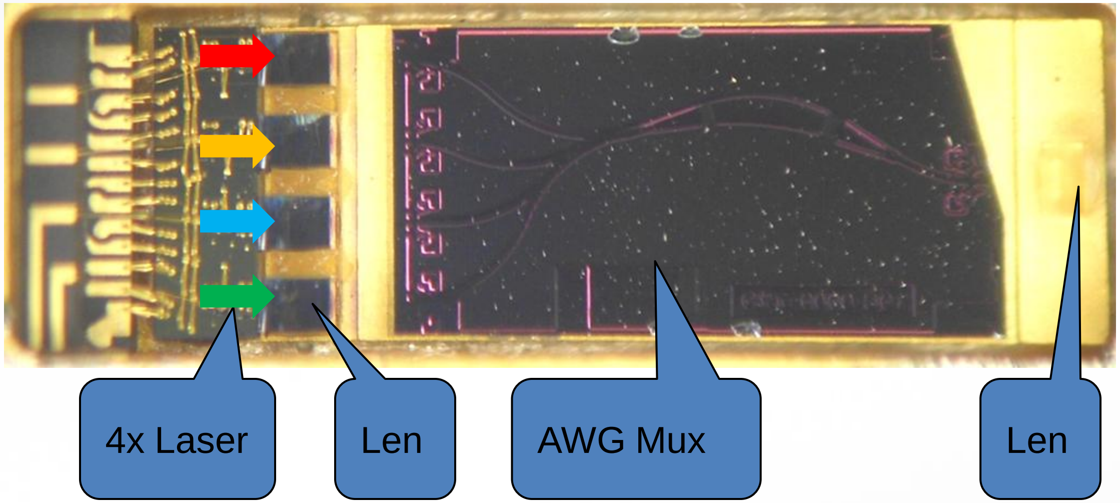
40GBASE-LR4 ROSA

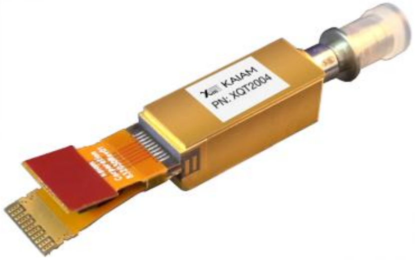


40GBASE-LR4 TOSA
Four uncooled 1310nm CWDM 10Gb/s DFB lasers

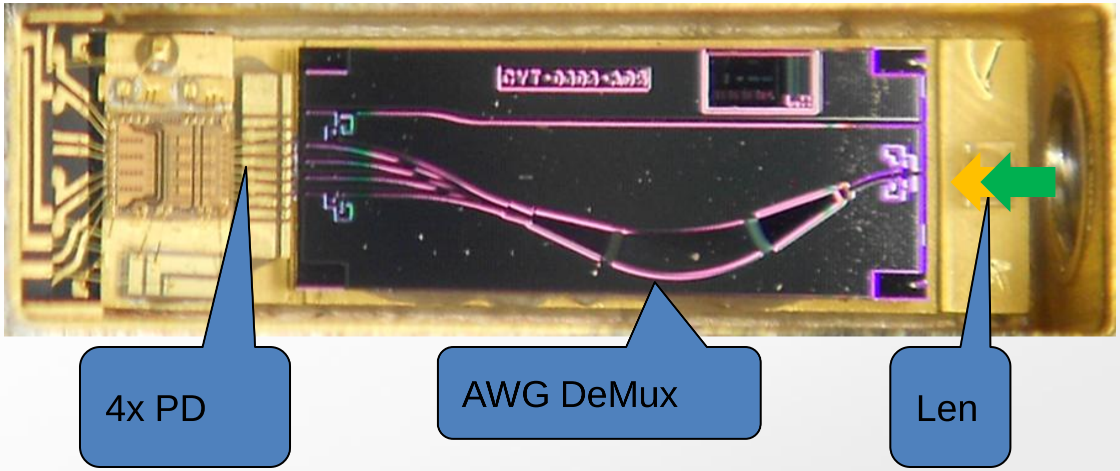
40GBASE-LR4 TOSA/ROSA Internal

40Gbase-LR4 TOSA





40Gbase-LR4 ROSA



***AWG stands for arrayed waveguide grating**

56G QSFP+ SR4

- 150m reach on Parallel multi-mode fiber(OM3)
- QSFP+ MSA module form factor
- IEEE 802.3ba 40Gbase-SR4 and FDR Infiniband

✓ 4x14.025G Optical

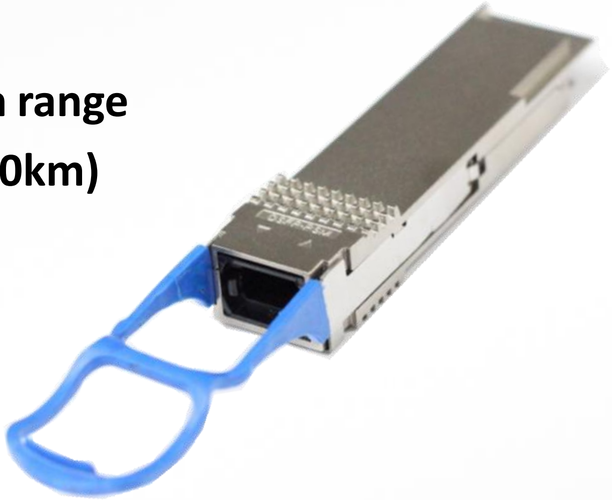
✓ 4x14.025G Electrical I/O

- Operating case temperature range of 0° C to +70° C
- Power consumption <1.5W
- Male MPO receptacle(12 Fiber)
- Digital Diagnostic function

Type	TX power（dBm）		RX power（dBm）	
	Min	Max	Min	Max
40Gbase-SR4	-7.5	+2.5	-12.0	+1.0
Center wavelength (nm)	**Operating temperature（C° ）**	**Rate per Channel（Typical）**	**Extinction ratio**	
			Min	**Max**
850	0 to 70	14.025	3.0	-

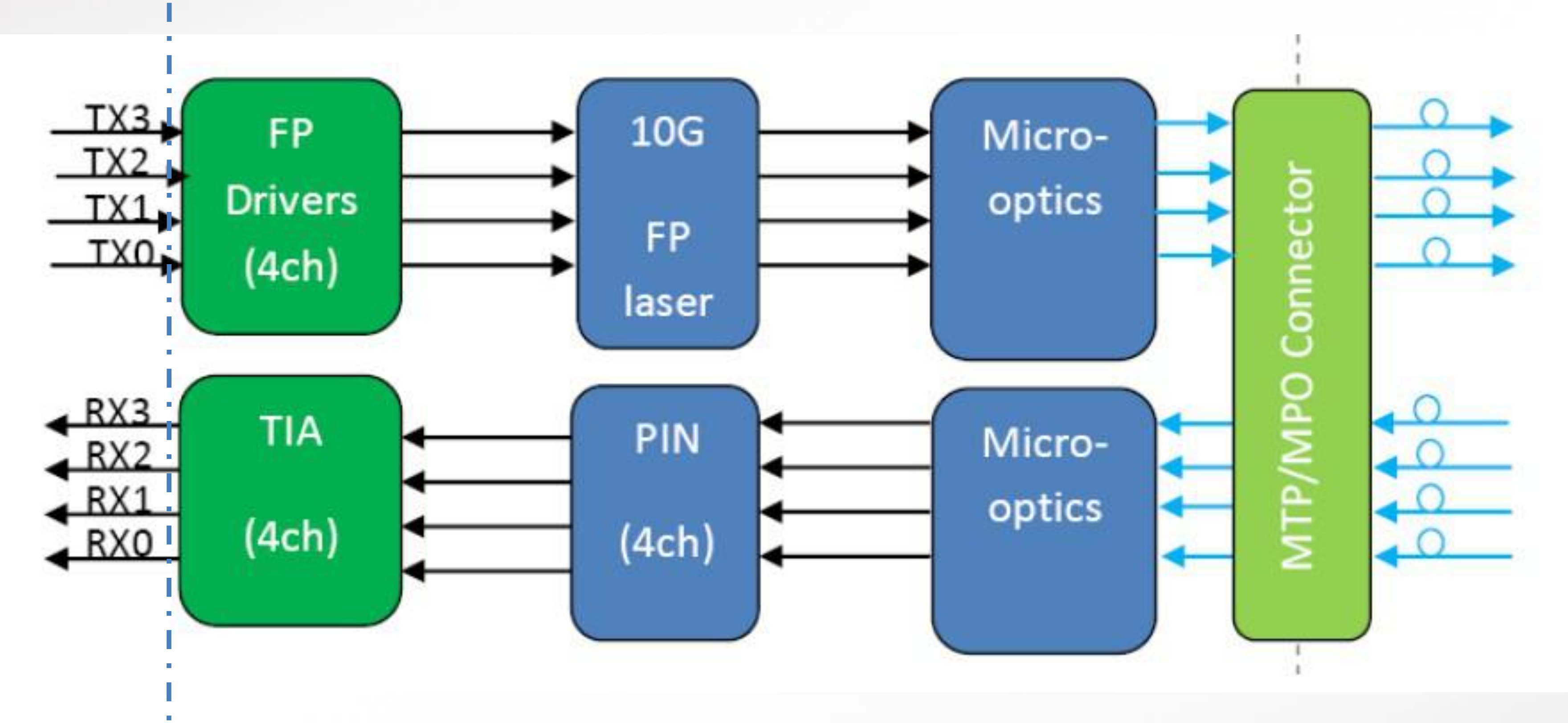
40G QSFP+ PSM4*(Parallel Single Mode)

- 2~ 10km reach 4x Lanes on Parallel Single mode via 8 fiber
- QSFP+ MSA module form factor
- Complaint with IEEE 802.3ba 40Gbase-LR4 Transmission range
- ✓ 4x10G Optical (1310nm FP for 0~2km or DFB for 0~10km)
- ✓ 4x10G Electrical I/O
- Operating case temperature range of 0° C to +70° C
- *Power consumption <3.5 W*
- Single mode male MPO receptacle(use 8 SMF)
- Interoperate with 4 x 10GBASE-LR links (10G SFP+ LR)



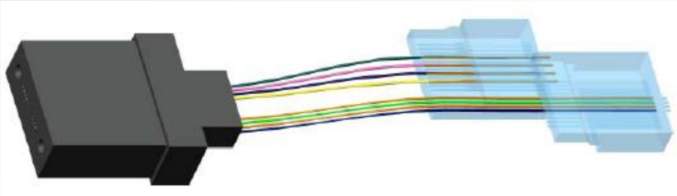
Type	TX power（dBm）		RX power（dBm）	
	Min	Max	Min	Max
40Gbase-PSM4	-5.5	+1.5	-11.5	+2.0
Center wavelength (nm)	Operating temperature （C° ）	Rate per Channel （Typical）	Extinction ratio	
			Min	Max
1310	0 to 70	10.3125	3.5	-

40G QSFP+ PSM4 Block Diagram

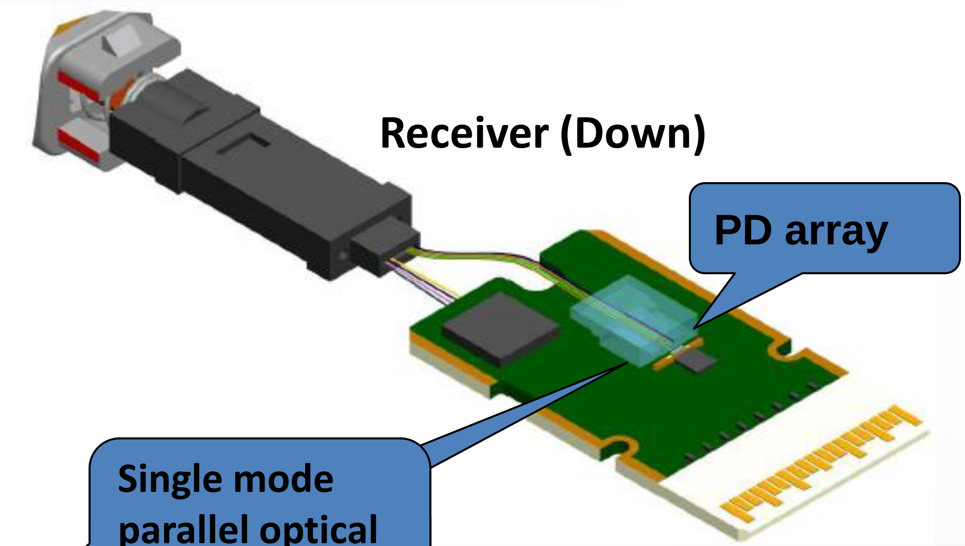


XLPPI

40G QSFP+ PSM4 Coupling Technology



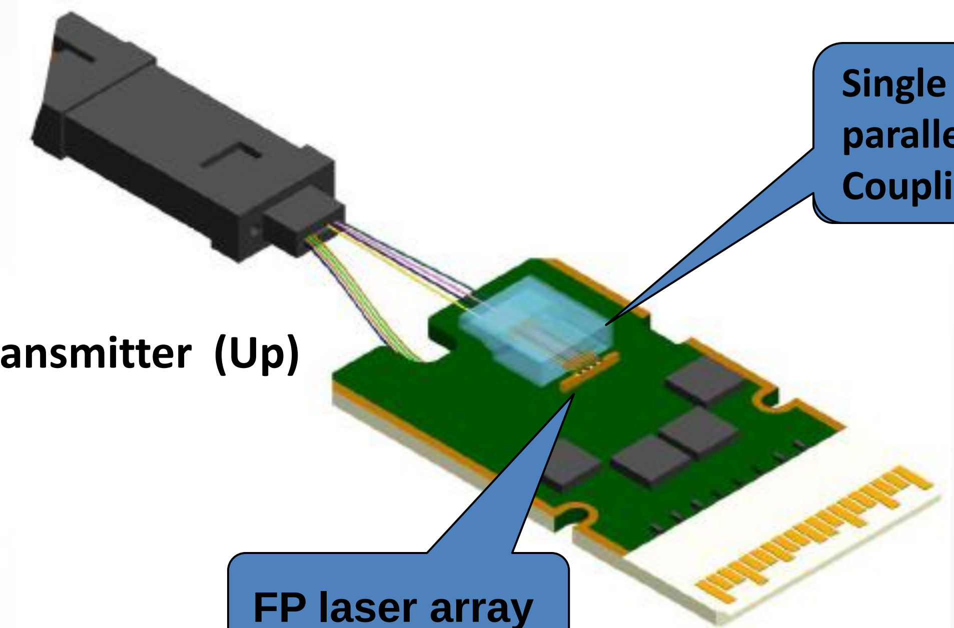
Dual Fiber Array Device for coupling Laser array and PD array into Single mode Ribbon fiber



Receiver (Down)

PD array

Single mode parallel optical Coupling



Transmitter (Up)

FP laser array

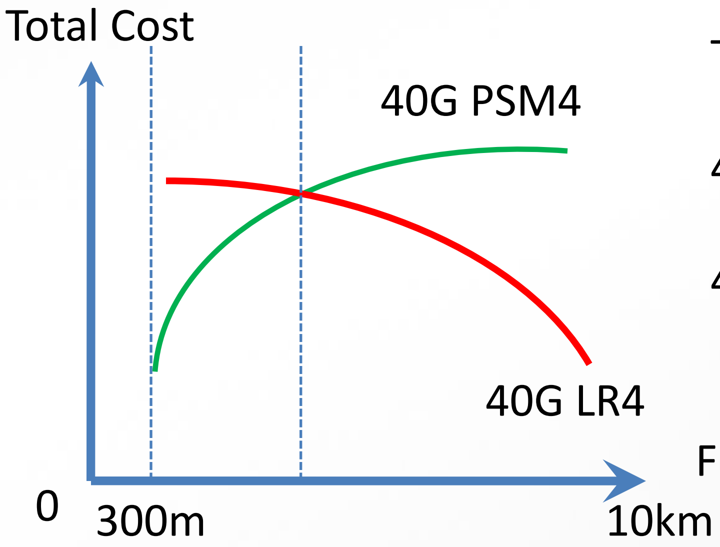
✓Chip on Board (CoB) optoelectronic device design and packaging technology.

✓Single mode parallel optical design and precision manufacturing technology

Why We develop 40G QSFP+ PSM4

✓Our Customer want 40G QSFP+ Parallel Single mode products , like Baidu, Alibaba

✓40G QSFP+ to 4x 10G SFP+ Breakout Multi-mode Active Optical Cable cannot meet customer’s requirement, they need long range for this application, if they use 40GBASE-LR QSFP+ 10km, it cost too much because no need 10km capacity.

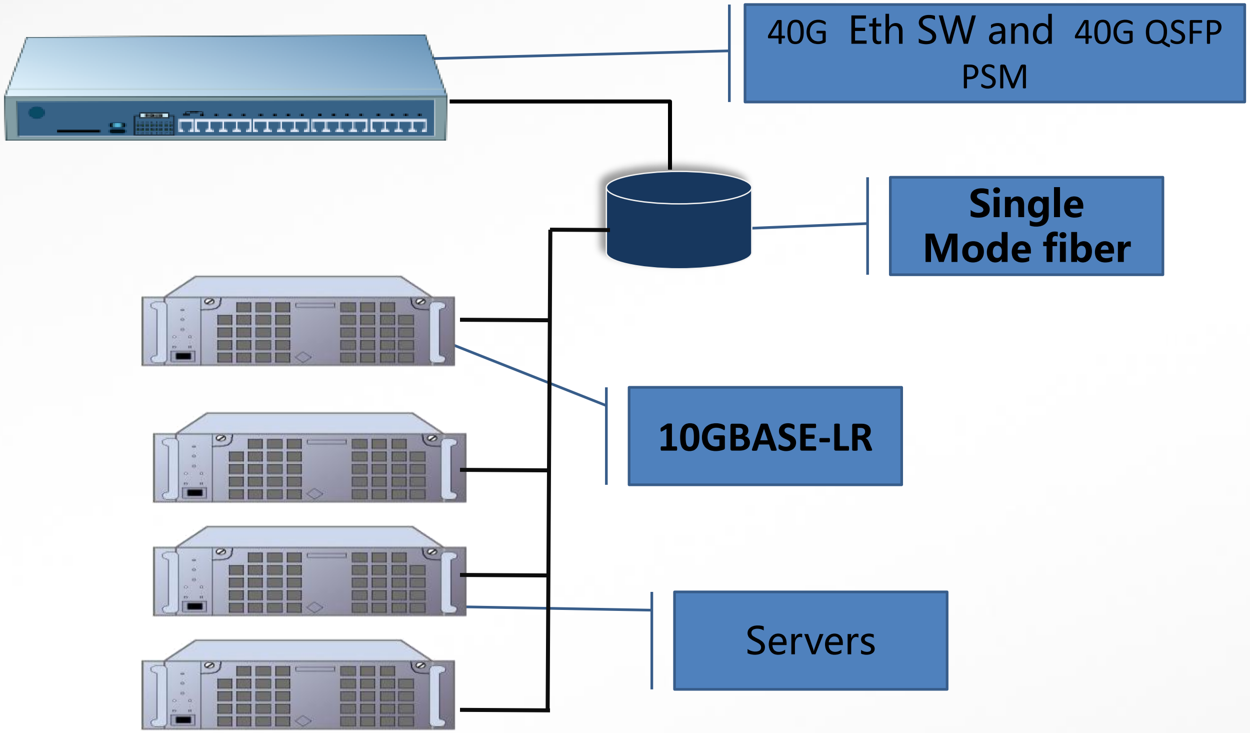


Total Cost = Module + Fiber

40G PSM4 Total Cost = Low price Module + 8 SM Fiber

40G LR4 Total Cost = High price Module + 2 SM Fiber

40G QSFP+ PSM4 Application



Low Cost Solution for 2km 40Gb Ethernet Links Targets 2km mega-data center links Large scale data center applications.

40G QSFP+ Application

Mellanox 40G InfiniBand Switch

Cisco Nexus 3000 Series 40G Ethernet Switch

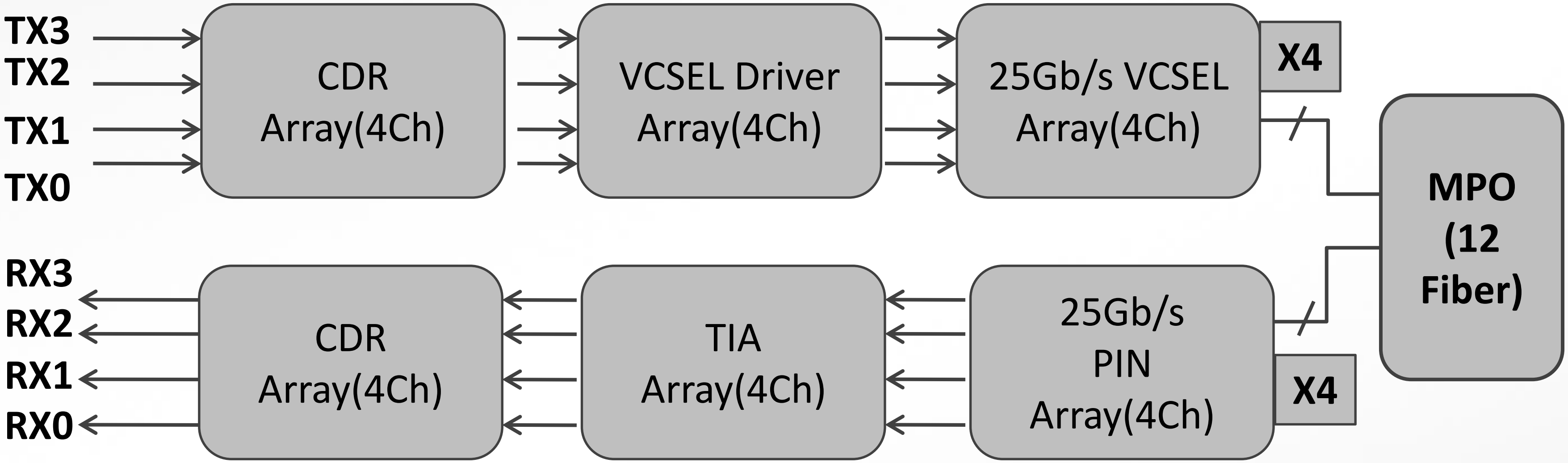
100G QSFP28 SR4*

- **100m reach on Parallel multi-mode fiber(OM3)**
- **QSFP+ MSA module form factor**
- **Complaint with IEEE 802.3bm* 100Gbase-SR4**
  - ✓ **4x25G Optical 850nm VCSEL**
  - ✓ **4x25G Electrical I/O (CDR is optional)**
- **Operating case temperature range of 0° C to +70° C**
- **Typical Power consumption 2W(CDR is bypassed)**
- **Male MPO receptacle(8 Fiber)**
- **Digital Diagnostic function**

CFP4 is slightly wider and longer than QSFP28, CFP4 is used for Line side

Type	TX power（dBm）		RX power（dBm）	
	Min	Max	Min	Max
100Gbase-SR4	TBD	TBD	TBD	TBD
Center wavelength (nm)	**Operating temperature（C°）**	**Rate per Channel（Typical）**	**Extinction ratio**	
			Min	**Max**
850	0 to 70	25	TBD	-

100G QSFP28 SR4 Block Diagram



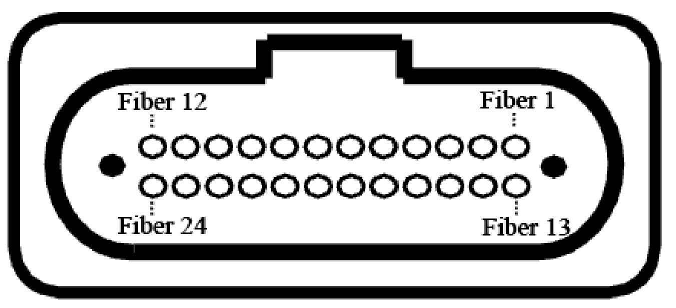
(CDR Array is optional)

100G CFP SR10

- 300 m reach on Parallel multi-mode fiber(OM4)
- CFP MSA module form factor
- IEEE 802.3ba 100Gbase-SR10
  - ✓ 10x10G Optical
  - ✓ 10x10G Electrical I/O (CAUI, CDR)
- Operating case temperature range of 0° C to +70° C
- Power consumption < 8W
- Male MPO receptacle(24 Fiber)
- Digital Diagnostic function

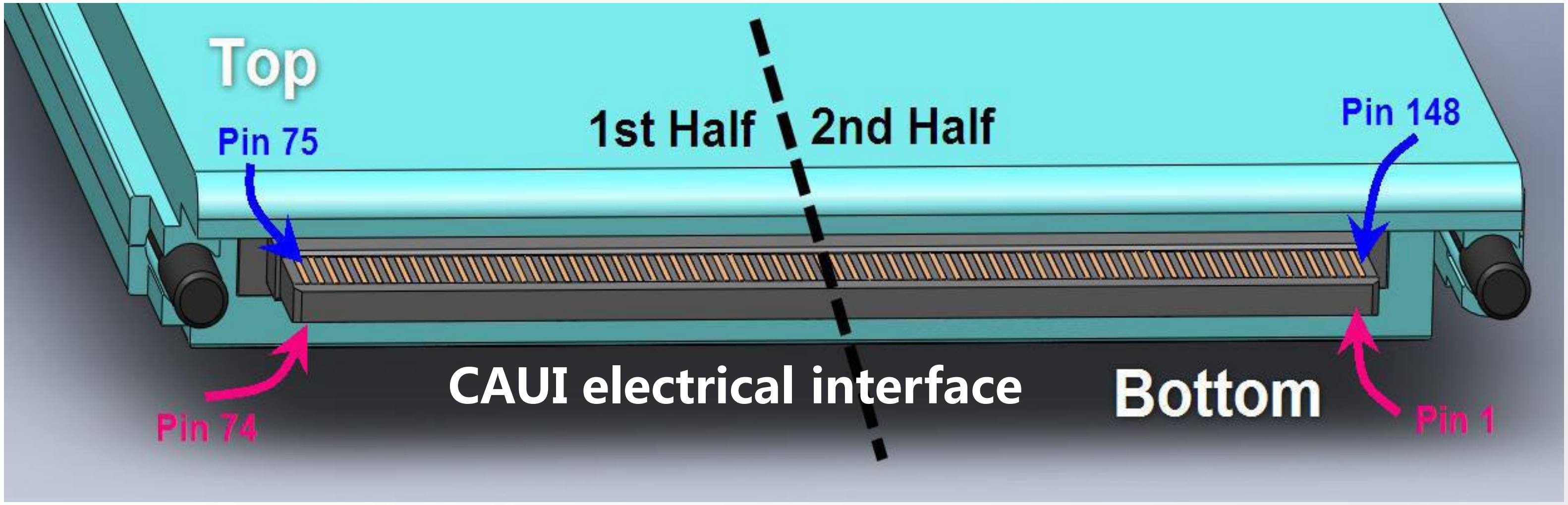
Type	TX power（dBm）		RX power（dBm）	
	Min	Max	Min	Max
100Gbase-SR10	-8	+1	-12.0	+1.0
Center wavelength (nm)	Operating temperature（C° ）	Rate per Channel（Typical）	Extinction ratio	
			Min	Max
850	0 to 70	10.3125	3.0	-

100G CFP SR10 Optical and electrical Interface

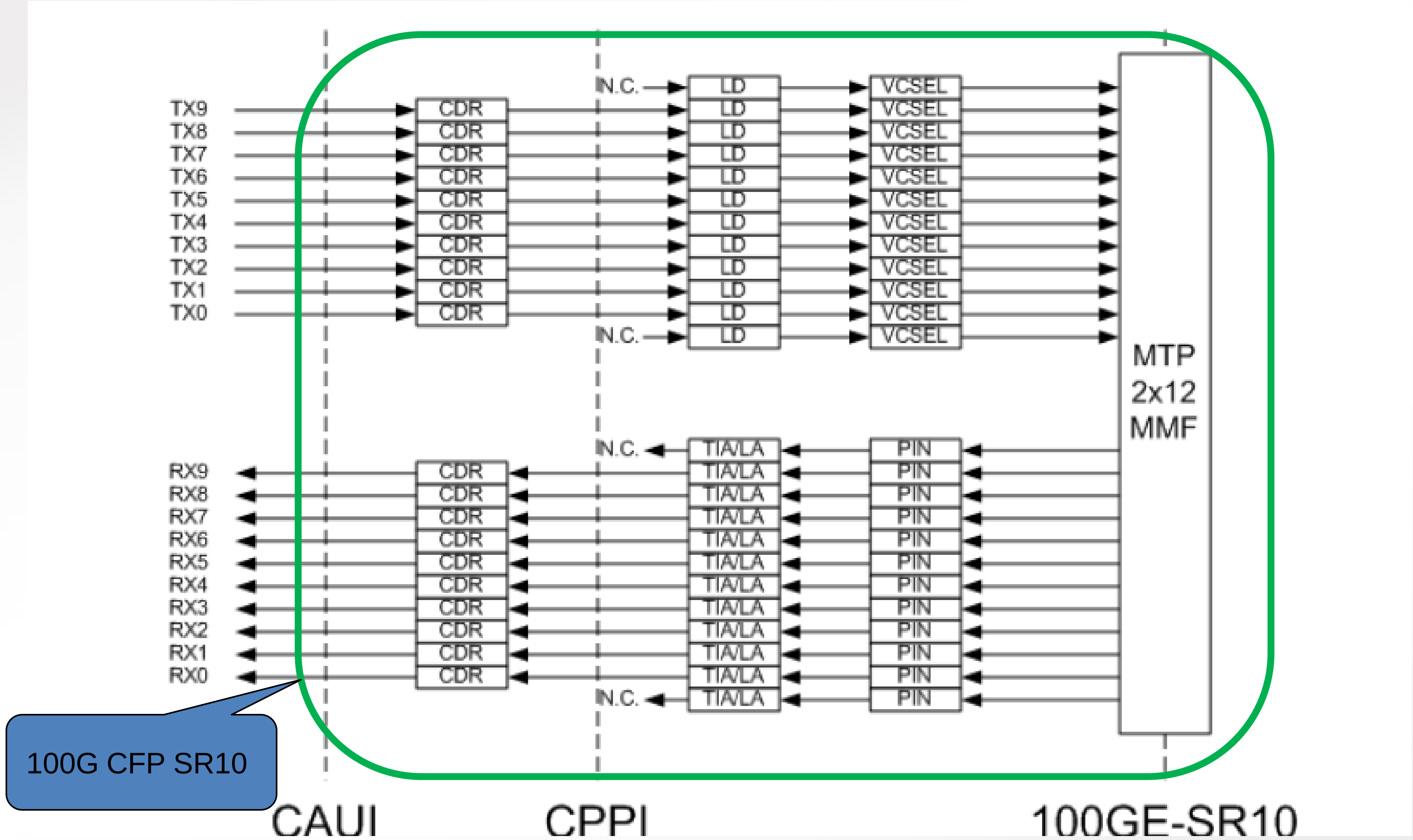


Male MPO receptacle
with 24 fibers
1, 12, 13, 24 four fiber unused

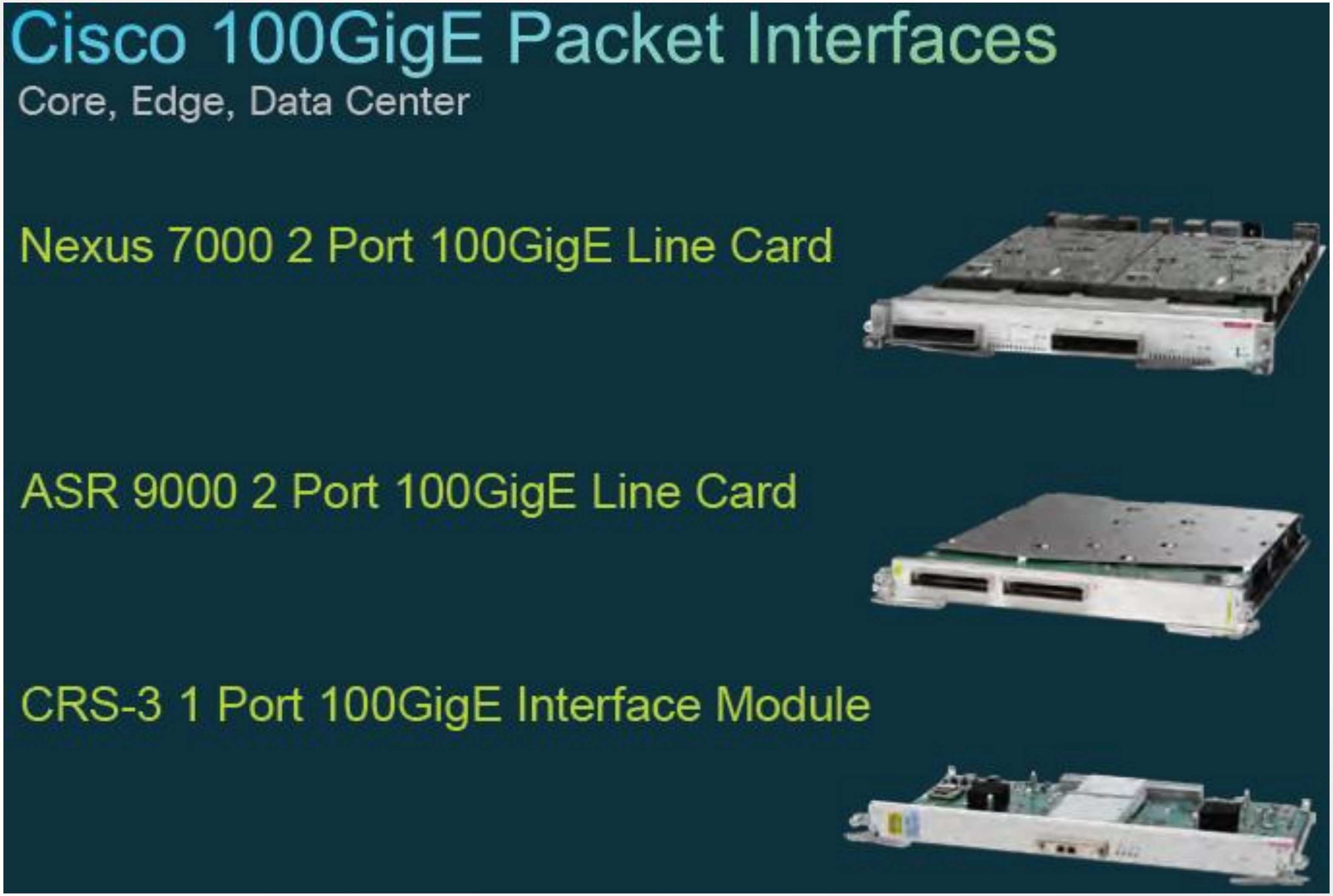
MPO 24-fiber
Female connecter



100G CFP SR10 Module Block Diagram



100G CFP SR10 Application



Cisco 100GigE Packet Interfaces

Core, Edge, Data Center

Data Center

Nexus 7000 2 Port 100GigE Line Card

Edge

ASR 9000 2 Port 100GigE Line Card

Core

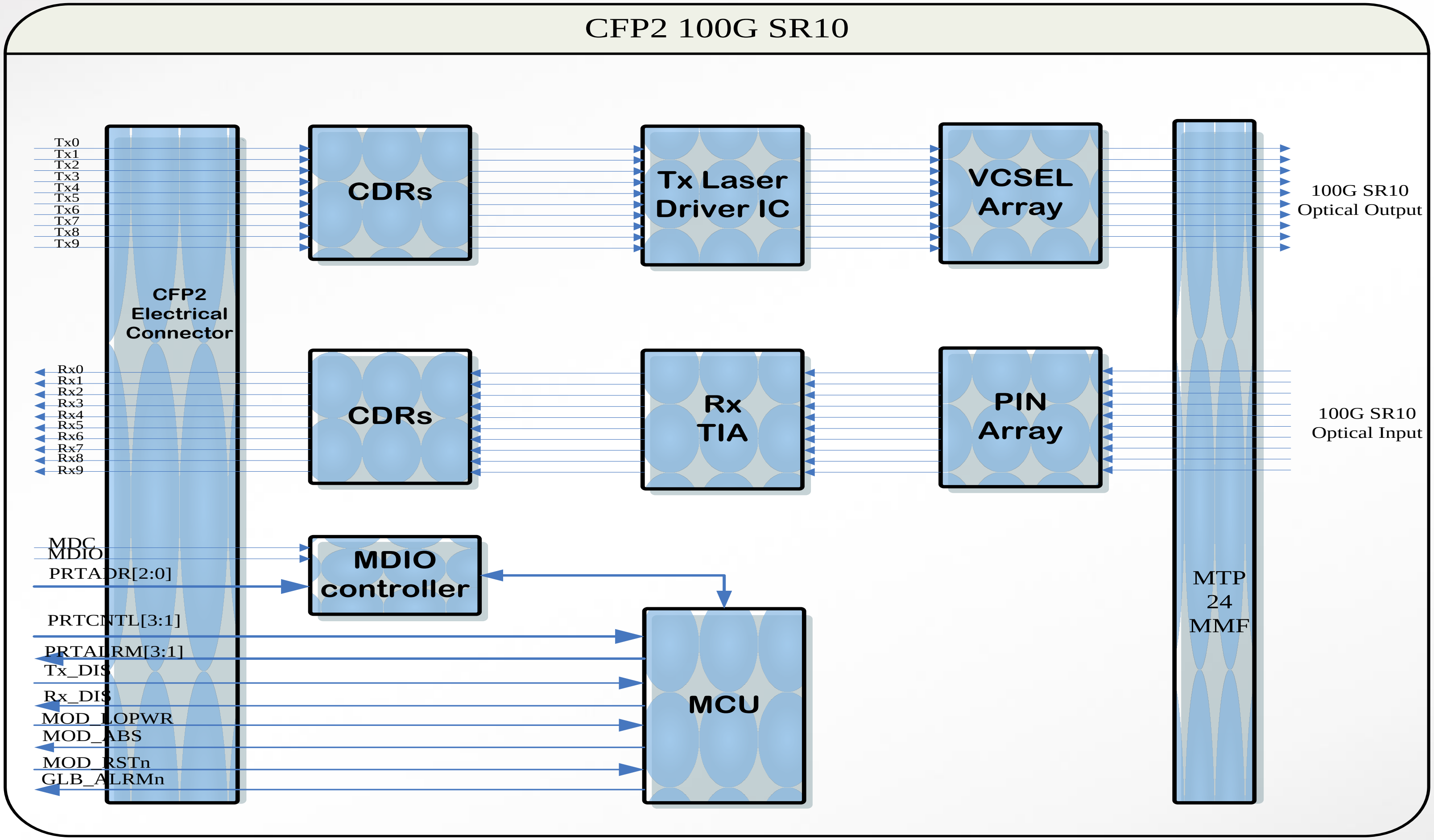
CRS-3 1 Port 100GigE Interface Module

100G CFP2 SR10*

- Compliant to 100G BASE-SR10 PMD Spec and IEEE 802.3ba ,
- CFP2 MSA Standard
- Up to 300m on OM3 MMF* ,
- Up to 11.2Gbit/s ,
- OTU4 compatible
- 10 Channels 850nm VCSEL array,
- 10 Channels PIN Photo detector array
- TX and RX CDR Retiming
- Power Consumption <6W
- Single MPO receptacle (24 fiber)
- MDIO Management Interface

Type	TX power（dBm）		RX power（dBm）	
	Min	Max	Min	Max
100Gbase-SR10	-8	+1	-12.0	+1.0
Center wavelength (nm)	Operating temperature （C° ）	Rate per Channel（Typical）	Extinction ratio	
			Min	Max
850	0 to 70	10.3125	3.0	-

100G CFP2 SR10 Block Diagram



100G CFP2 SR10 Application

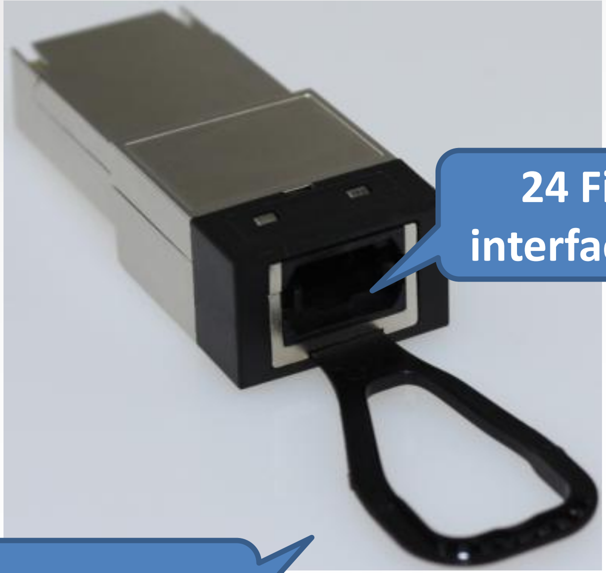
120G CXP MMF Module

- 300 m reach on Parallel multi-mode fiber(OM4)
- CXP MSA module form factor
- IEEE 802.3ba 100Gbase-SR10 and InfiniBand 12xQDR
  - ✓ 12x10G Optical
  - ✓ 12x10G Electrical I/O (CAUI)
- Operating case temperature range of 0° C to +70° C
- **Power consumption < 4.5W**
- Male MPO receptacle(24 Multi-mode Fiber)
- Digital Diagnostic function

Type	TX power（dBm）		RX power（dBm）	
	Min	Max	Min	Max
100Gbase-SR10	-7.6	2.4	-9.5	2.4

Center wavelength (nm)	Operating temperature（C°）	Rate per Channel（Typical）	Extinction ratio	
			Min	Max
850	0 to 70	10.3125	3.0	-

Gigalight 120G CXP Transceiver

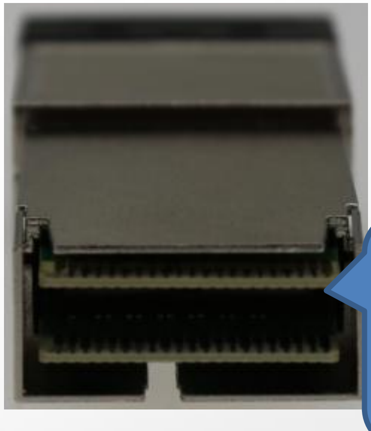


24 Fiber MPO interface（male）

Plug for Unlocking

MPO 24-fiber
Female connecter

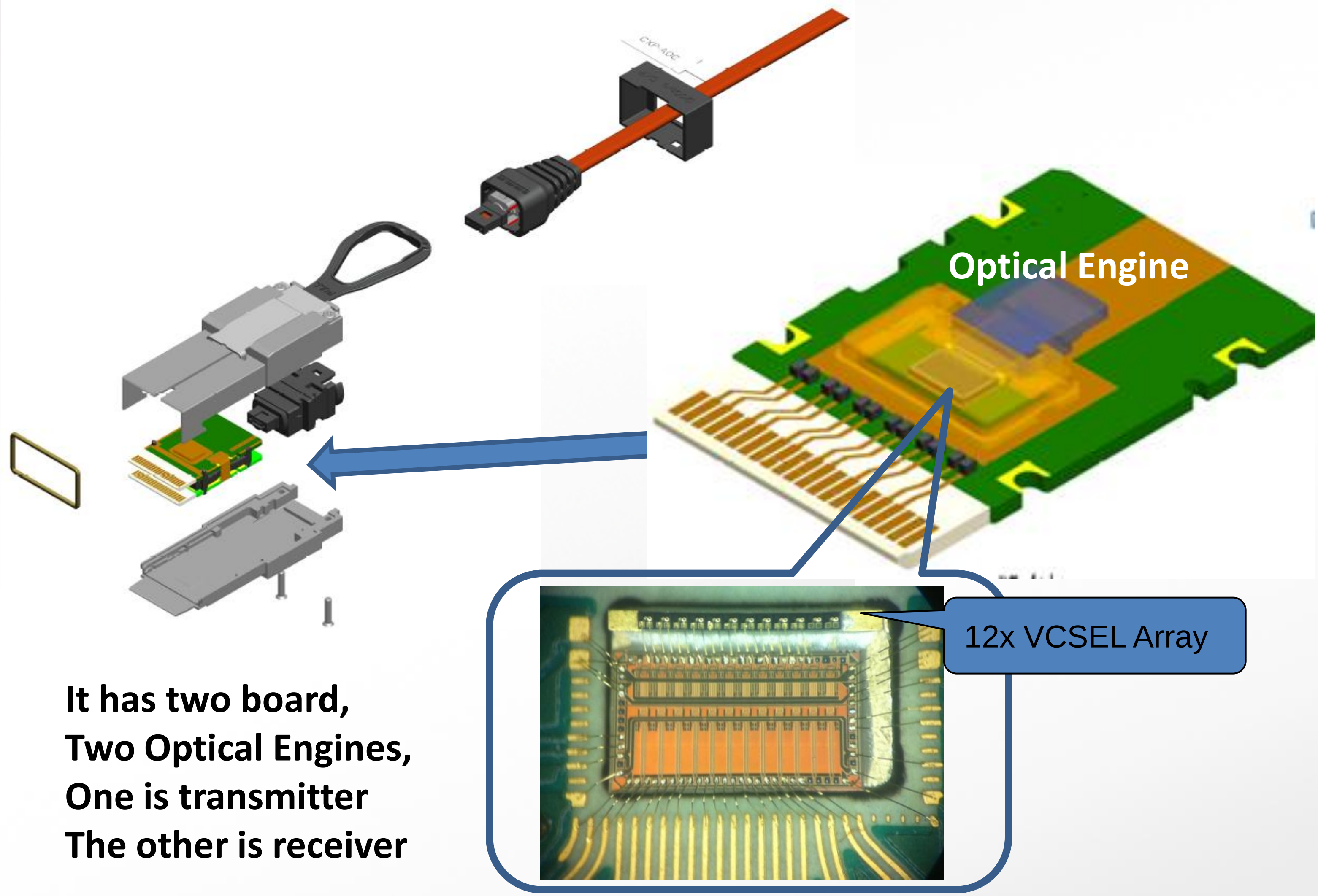
Latch mechanism



Two level PCBA (84 Pin， CPPI electrical interface)

CXP Active Optical Cable Internal (1)

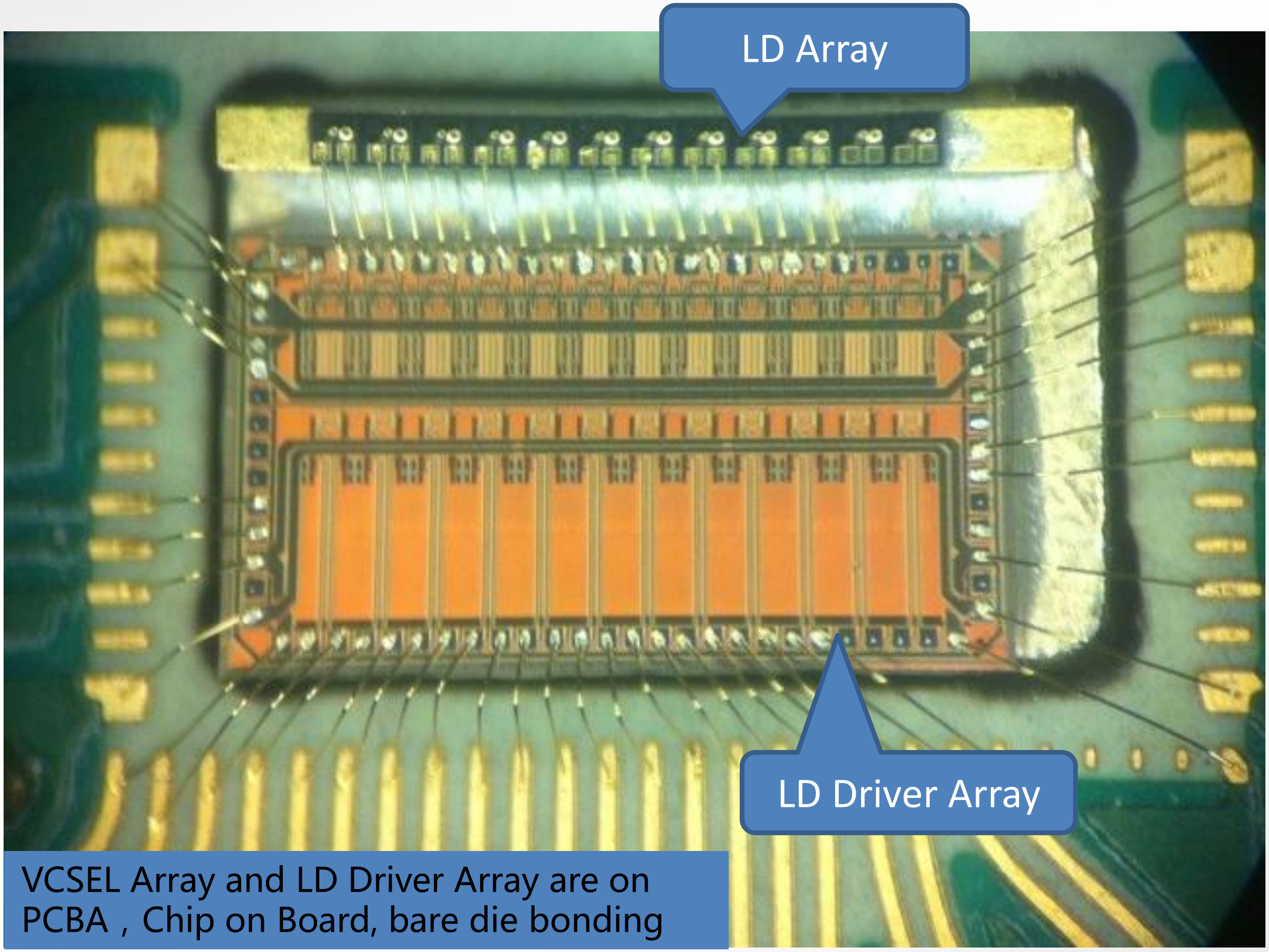
Use 12X VCSEL Array and LD Driver Array



It has two board,
Two Optical Engines,
One is transmitter
The other is receiver

CXP Active Optical Cable Internal (2)

Use 12X VCSEL Array



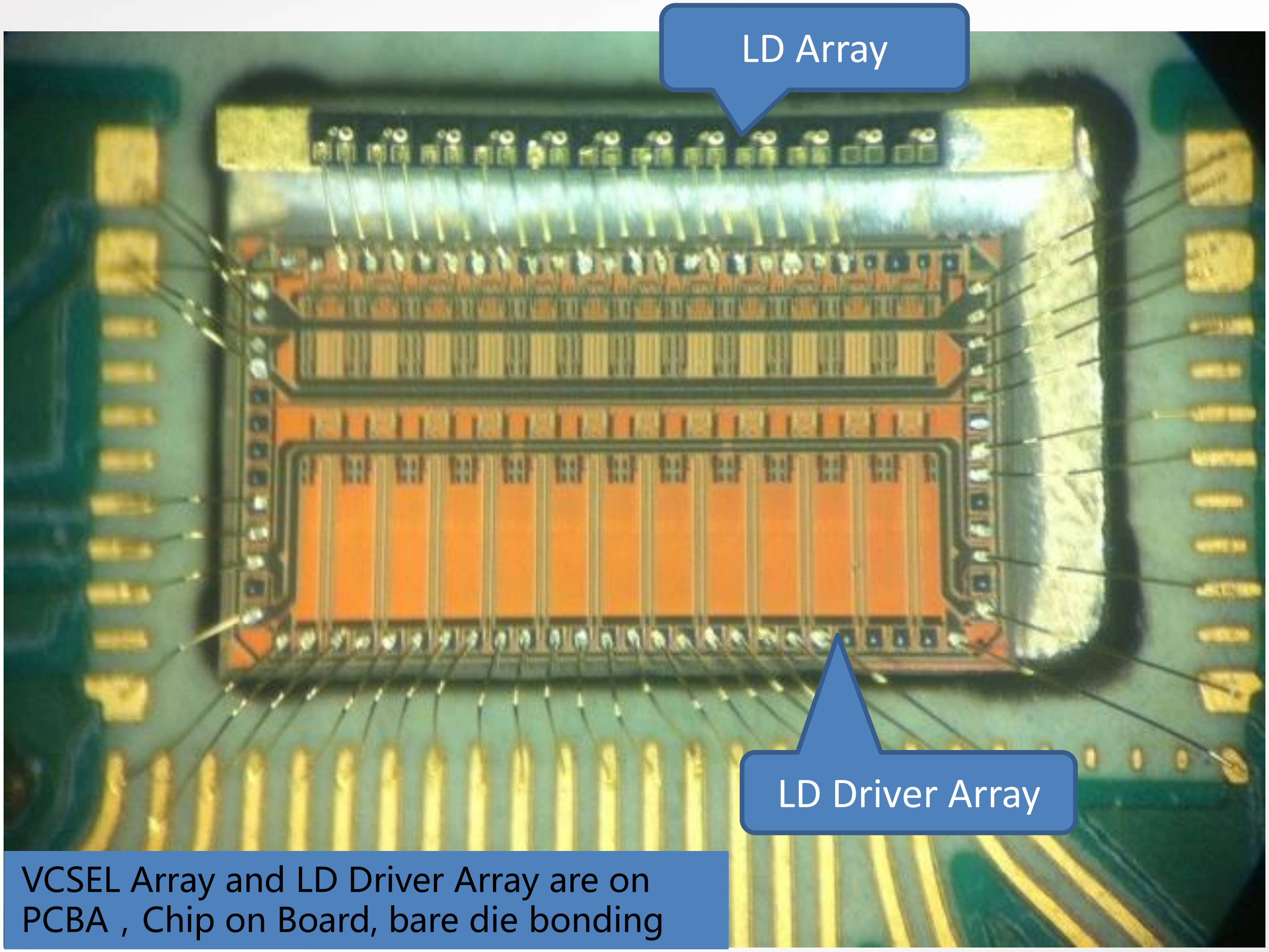
LD Array

LD Driver Array

VCSEL Array and LD Driver Array are on PCBA，Chip on Board, bare die bonding

CXP Active Optical Cable Internal (2)

Use 12X VCSEL Array



VCSEL Array and LD Driver Array are on PCBA , Chip on Board, bare die bonding

CXP Application

IS5050 and IS5055

6-port 120Gb/s (CXP) and 18-port 40Gb/s (QSFP) Non-blocking Managed InfiniBand Switch System

CXP Application

Oracle Provide InfiniBand Switch with CXP interface

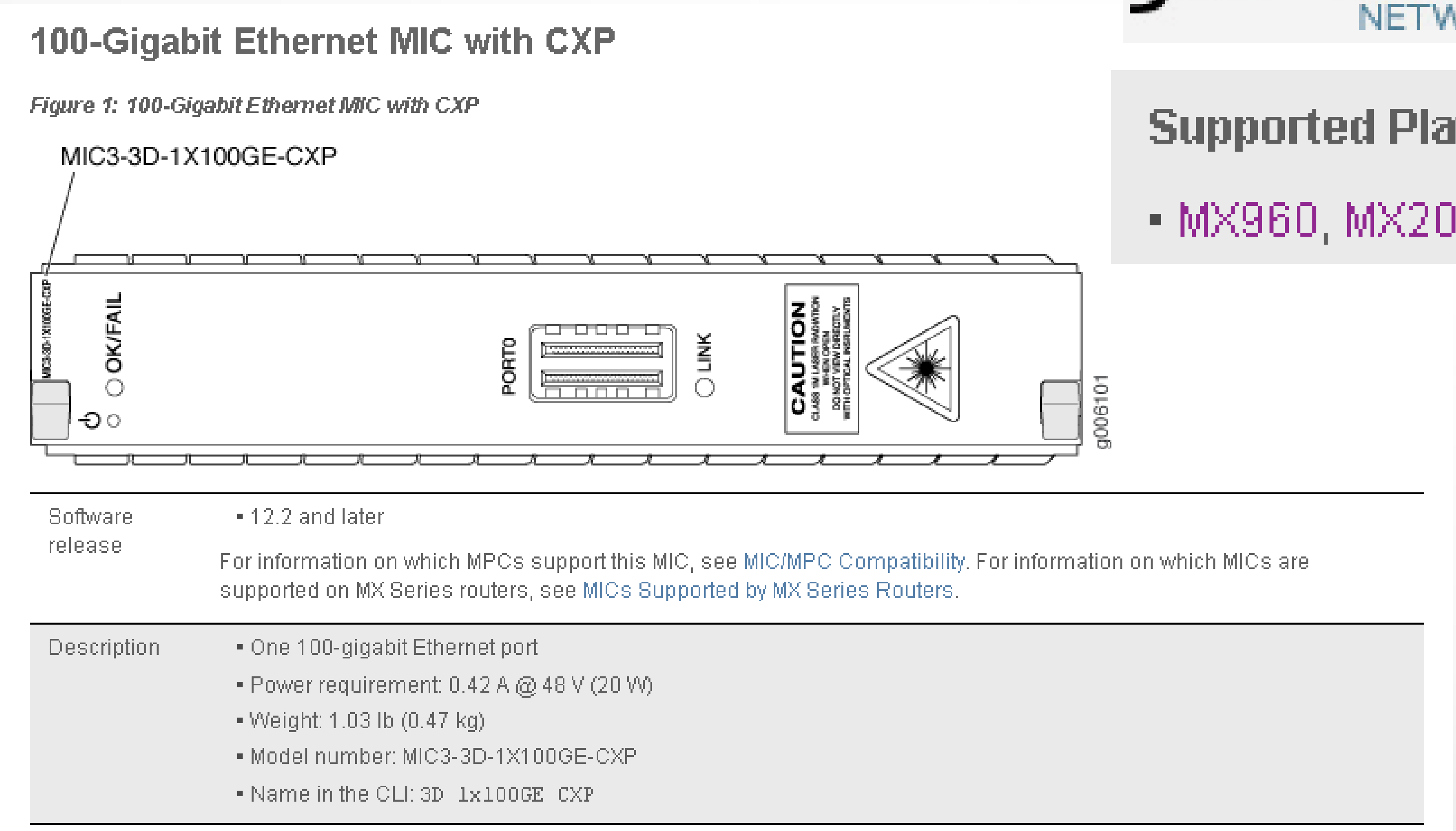
Sun

ORACLE

The Sun Datacenter IB Switch 648 has the capacity to handle massive scalability.

CXP Application

Juniper MX960's 100G Ethernet MIC support CXP Interface



100-Gigabit Ethernet MIC with CXP

Figure 1: 100-Gigabit Ethernet MIC with CXP

Software release	▪ 12.2 and later For information on which MPCs support this MIC, see MIC/MPC Compatibility. For information on which MICs are supported on MX Series routers, see MICs Supported by MX Series Routers.
Description	▪ One 100-gigabit Ethernet port ▪ Power requirement: 0.42 A @ 48 V (20 W) ▪ Weight: 1.03 lb (0.47 kg) ▪ Model number: MIC3-3D-1X100GE-CXP ▪ Name in the CLI: `3D 1x100GE CXP`

Supported Platforms

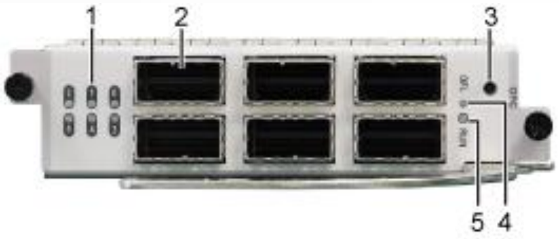
- MX960, MX2020

CXP Application

HUAWEI NetEngine5000E

Core Router

Supports CXP Interface



OFC100B panel appearance

Appearance of the OFC100B

1. CXP insertion indicator
2. OFC slot
3. OFL indicator
4. OFL button
5. RUN indicator

Thank you for your attention